STIC Search Report
EIC 1700

STIC Database Tracking Number: 220634

TO:	From:
Amy T Lang Location: Art Unit : 3731 April 6, 2007 Case Serial Number: 10820311	Mei Huang Location: EIC 1700 REMSEN 4B28 Phone: 571/272-3952 Mei.huang@uspto.gov

Search Notes

Examiner Lang,

Please feel free to contact me if you have any questions or if you would like to refine the search query.

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Mei Huang

RN S1H

Access DB# 220634

SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: Amy Lang Examiner # : ~~82342~~ 82324 Date: 4-2-07
Art Unit: 3731 Phone Number 30 29057 Serial Number: ~~10/820,311~~ 10/820311
Mail Box and Bldg/Room Location: RND 6D70 Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

****

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: Lubricant Grease for Low and High Temperature Application and Rolling Bearing

Inventors (please provide full names): Asao, Mitsunavi
Egami, Masaki

Earliest Priority Filing Date: 4-4-2003

***For Sequence Searches Only* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.**

Please search all claims. Thanks.

please expedite
MJ Hayes

MICHAEL J. HAYES
SUPERVISORY PATENT EXAMINER

****

STAFF USE ONLY

Searcher: INQH
Searcher Phone #:
Searcher Location:
Date Searcher Picked Up:
Date Completed: 4/16/07
Searcher Prep & Review Time:
Clerical Prep Time:
Online Time:

Type of Search

NA Sequence (#)
AA Sequence (#)
Structure (#) 1
Bibliographic
Litigation
Fulltext
Patent Family
Other

Vendors and cost where applicable

STN
Dialog
Questel/Orbit
Dr.Link
Lexis/Nexis
Sequence Systems
WWW/Internet
Other (specify)

Claims

1 (currently amended) Lubricant grease for low and high temperature application, comprising a mixed grease and polyolefin oil, wherein said mixing grease comprises fluorine-containing lubricant grease containing perfluoropolyether oil as a base oil thereof and fluorocarbon resin powder as a thickening agent thereof and urea-containing lubricant grease containing polyester oil as a base oil thereof and a urea compound as a thickening agent thereof, wherein 3 to 30 parts by weight of said polyolefin oil is added to 100 parts by weight of said mixed grease , and said polyolefin oil has a pour point of not more than -50°C and a kinematic viscosity of 20 to 70mm^2/s at 40°.

2 (canceled)

3 (currently amended):Lubricant grease according to claim 1, wherein said urea-containing lubricant grease has [[a]] an evaporation amount not more than 25 wt%, when said urea-containing lubricant grease is kept at 200 °C for 250 hours.

4 (currently amended): Lubricant grease according to claim 3, wherein said polyester oil is an aromatic ester compound of monovalent alcohol having 7 to 22 carbon atoms and aromatic tricarboxylic or tetracarboxylic acid or derivatives thereof and/or aliphatic ester compound of monovalent carboxylic acid having 7 to 22 carbon atoms and ~~trimetylolpropane~~ trimethylolproprane, pentaerythritol or ~~dipentapentaerythritol~~ dipentaerythritol.

L3-L5

5 (original): Lubricant grease according to claim 4, wherein said polyester oil is an aromatic ester compound of monovalent alcohol having 7 to 22 carbon atoms and aromatic tricarboxylic or tetracarboxylic and acid or derivatives thereof.

6 (original): Lubricant grease according to claim 3, wherein a urea compound serving as a base oil of said urea-containing lubricant grease is shown by a chemical formula below:

R_1-NHCONH-R_3-NHCONH-R_2

L28 1-20

where R_3 is an aromatic group; R_1 and R_2 are selected one among an aliphatic group, and alicyclic group, and an aromatic group respectively; R_1 and R_2 are to be the same or different from each other.

7 (original): Lubricant grease according to claim 3, wherein for 100 wt% of an entire amount of said urea-containing lubricant grease, 70 to 95 wt% of said ester oil and 30 to 5 wt% of said urea compound are mixed with each other.

8 (original): Lubricant grease according to claim 1, wherein 100 wt% of an entire amount of said fluorine-containing lubricant grease, 70 to 90 wt% of said perfluoropolyether oil and 10 to 30 wt% of said fluorocarbon resin powder are mixed with each other.

9 (original): Lubricant grease according to claim 8, wherein said fluorocarbon resin powder is polytetrafluoroethylene resin powder.

10 (original): Lubricant grease according to claim 1, wherein said mixed grease contains 25 to 70 wt% of said fluorine-containing lubricant grease and 30 to 75 wt% of said urea-containing lubricant grease.

11 (original): Lubricant grease according to claim 1, wherein said mixed grease is applied for electric auxiliaries for a car.

12 (original): A rolling bearing comprising an inner ring; an outer ring concentrate with said inner ring; a plurality of rolling elements disposed between the inner ring and said outer ring; and lubricant grease sealed on a periphery of said rolling elements, wherein said lubricant grease is the grease for low and high temperature application according to claim 1.

13 (original): A rolling bearing according to claim 12, wherein said rolling bearing is applied for electric auxiliaries of a car.

STIC Search Results Feedback Form

EIC17000

Questions about the scope or the results of the search? Contact *the EIC searcher or contact*:

Kathleen Fuller, EIC 1700 Team Leader
571/272-2505 REMSEN 4B28

Voluntary Results Feedback Form

- *I am an examiner in Workgroup:* [ ] *Example: 1713*
- *Relevant prior art* ***found****, search results used as follows:*
  - ☐ 102 rejection
  - ☐ 103 rejection
  - ☐ Cited as being of interest.
  - ☐ Helped examiner better understand the invention.
  - ☐ Helped examiner better understand the state of the art in their technology.

Types of relevant prior art found:

- ☐ Foreign Patent(s)
- ☐ Non-Patent Literature
  (journal articles, conference proceedings, new product announcements etc.)

- *Relevant prior art* ***not found:***
  - ☐ Results verified the lack of relevant prior art (helped determine patentability).
  - ☐ Results were not useful in determining patentability or understanding the invention.

Comments:

Drop off or send completed forms to EIC1700 REMSEN 4B28

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STRUCTURE FILE UPDATES:    5 APR 2007  HIGHEST RN 929247-80-3
DICTIONARY FILE UPDATES:   5 APR 2007  HIGHEST RN 929247-80-3

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=> d l9 que stat
L7                STR

        10              11
        O               O
        ||              ||
C~~NH~C~~NH~Cy~NH~C~~NH~C
1   2   3   4   5   6   7   8   9

NODE ATTRIBUTES:
NSPEC    IS RC     AT   1
NSPEC    IS RC     AT   9
DEFAULT MLEVEL IS ATOM
GGCAT    IS UNS  AT   5
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS  11

STEREO ATTRIBUTES: NONE
L9          2925 SEA FILE=REGISTRY SSS FUL L7

100.0% PROCESSED   33471 ITERATIONS                          2925 ANSWERS
SEARCH TIME: 00.00.01



=> d his nofile

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L2             7 SEA ABB=ON  (101-68-8/BI OR 106-49-0/BI OR 111-86-4/BI
                 OR 115-77-5/BI OR 126-58-9/BI OR 57-13-6/BI OR 77-99-6/BI
                 )
                 D SCA
L3             1 SEA ABB=ON  PLU=ON  77-99-6/RN
L4             1 SEA ABB=ON  PLU=ON  PENTAERYTHRITOL/CN
L5             1 SEA ABB=ON  PLU=ON  DIPENTAERYTHRITOL/CN
L6             1 SEA ABB=ON  PLU=ON  57-13-6/RN

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L7               STR

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L8            50 SEA SSS SAM L7
L9          2925 SEA SSS FUL L7
                 SAV L9 LAN311/A

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L10         2856 SEA ABB=ON  PLU=ON  (L3 OR L4 OR L5)(L)RACT+ALL/RL
L11        11626 SEA ABB=ON  PLU=ON  LUBRICA?(2A)GREASE?
L12         1049 SEA ABB=ON  PLU=ON  (ADDITIVE? OR ADJUVANT? OR AUXILIAR?)
                 (3A)(CAR OR AUTO# OR AUTOMO? OR VEHICLE)
L13            1 SEA ABB=ON  PLU=ON  L10(L)(L11 OR L12)
L14         2348 SEA ABB=ON  PLU=ON  POLYESTER?(2A)OIL
L15              QUE ABB=ON  PLU=ON  LUBRIC? OR ANTIWEAR? OR ANTICORRO?
                 OR ANTIOXID? OR ANTIRUST? OR ANTIFRIC? OR ANTI(W)(WEAR?
                 OR CORRO? OR OXID? OR RUST? OR FRIC?) OR ABRASION(W)RESIS
                 T?
L16              QUE ABB=ON  PLU=ON  ((FLUORO? OR FLUORI? OR F)(W)(CONTAIN
                 ? OR CONTG#) OR FLUORO? OR FLUORI?)(2A)(POLYM? OR
                 COPOLYM? OR HOMOPOLYM? OR RESIN?)
L17              QUE ABB=ON  PLU=ON  FLUOROPOLYMER# OR PERFLUOROPOLYMER#
                 OR PER(W)FLUOROPOLYMER#
L18              QUE ABB=ON  PLU=ON  POLYESTER
L19              QUE ABB=ON  PLU=ON  POLYOLEFIN
L20              QUE ABB=ON  PLU=ON  POLYETHYLENE# OR POLYETHENE# OR PE
                 OR POLYPROPYLENE# OR POLYPROPENE# OR PP OR POLYBUTYLENE#
                 OR POLYISOBUTYLENE# OR POLYBUTENE# OR POLYISOBUTENE#
L21              QUE ABB=ON  PLU=ON  POLY(W)(ETHYLENE# OR ETHENE# OR
                 PROPYLENE# OR PROPENE# OR BUTYLENE# OR ISOBUTYLENE# OR
                 BUTENE#)
L22              QUE ABB=ON  PLU=ON  (ETHYLEN## OR PROPYLEN## OR BUTYLEN##
                  OR BUTEN## OR OLEFIN##)(A)(POLYMER? OR POLYM# OR
                 HOMOPOLYMER? OR HOMOPOLYM# OR RESIN?)
L23         4367 SEA ABB=ON  PLU=ON  L6/D
L24        23831 SEA ABB=ON  PLU=ON  L6(L)MOA+ALL/RL
L25         2611 SEA ABB=ON  PLU=ON  L23 AND L24
L26          889 SEA ABB=ON  PLU=ON  L9
L27           32 SEA ABB=ON  PLU=ON  L9(L)(L11 OR L12 OR L15)
L28           20 SEA ABB=ON  PLU=ON  L27 AND (L11 OR L12)
L29              QUE ABB=ON  PLU=ON  UREA(A)(CONTAIN? OR CONTG#)
L30              QUE ABB=ON  PLU=ON  PERFLUOR?(A)POLYETHER? OR PERFLUOROPO
                 LYETHER?
L31        18557 SEA ABB=ON  PLU=ON  (L16 OR L17 OR L30) AND (L19 OR L20
                 OR L21 OR L22)
L32            3 SEA ABB=ON  PLU=ON  L31 AND L29
L33            1 SEA ABB=ON  PLU=ON  L32 AND (L11 OR L12 OR L15)
L34         6426 SEA ABB=ON  PLU=ON  L31 AND L18
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L35          43 SEA ABB=ON  PLU=ON  L31 AND L14
L36          10 SEA ABB=ON  PLU=ON  L35 AND (L11 OR L12 OR L15)
L37          15 SEA ABB=ON  PLU=ON  L34 AND L10
L38           2 SEA ABB=ON  PLU=ON  L37 AND (L11 OR L12 OR L15)
L39          11 SEA ABB=ON  PLU=ON  L33 OR L36 OR L38
L40         128 SEA ABB=ON  PLU=ON  L10(L)(L11 OR L12 OR L15)
L41          10 SEA ABB=ON  PLU=ON  L40 AND (L11 OR L12)
L42          66 SEA ABB=ON  PLU=ON  L25 AND (L11 OR L12)
L43             QUE ABB=ON  PLU=ON  THICKEN?(2A)(AGENT? OR ADDITIVE? OR
                COMPOUND? OR COMPD# OR CMPD# OR CPD#)
L44          39 SEA ABB=ON  PLU=ON  L42 AND L43
L45          14 SEA ABB=ON  PLU=ON  L37 AND (1907-2003)/PY,PRY,AY
L46          38 SEA ABB=ON  PLU=ON  L44 AND (1907-2003)/PY,PRY,AY
L47           5 SEA ABB=ON  PLU=ON  L46 AND (L16 OR L17)
L48           4 SEA ABB=ON  PLU=ON  L47 NOT L1
L49          10 SEA ABB=ON  PLU=ON  L41 AND (1907-2003)/PY,PRY,AY
L50           9 SEA ABB=ON  PLU=ON  L49 NOT (L45 OR L48)
L51          18 SEA ABB=ON  PLU=ON  L28 AND (1907-2003)/PY,PRY,AY
L52          18 SEA ABB=ON  PLU=ON  L51 NOT (L45 OR L48 OR L50)
L53        1373 SEA ABB=ON  PLU=ON  (FLUOROCARBON? OR FLUOR?(A)CARBON?
                OR POLYTETRAFLUOROETHYLENE OR TEFLON)(3A)POWDER?
L54          20 SEA ABB=ON  PLU=ON  L53 AND (L11 OR L12)
L55           7 SEA ABB=ON  PLU=ON  L54 AND L43
L56           5 SEA ABB=ON  PLU=ON  L55 AND (1907-2003)/PY,PRY,AY
L57           4 SEA ABB=ON  PLU=ON  L56 NOT (L45 OR L48 OR L50 OR L52)
L58           1 SEA ABB=ON  PLU=ON  L39 NOT (1907-2003)/PY,PRY,AY


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=> d l45 ibib abs hitstr hitind 1-14

L45  ANSWER 1 OF 14  HCAPLUS  COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER:         2005:33676  HCAPLUS
DOCUMENT NUMBER:          142:95943
TITLE:                    Recyclable radiation-curable hard coating
```

compositions showing good abrasion resistance and lubricity, and plastic moldings coated with them

INVENTOR(S): Kondo, Satoshi; Higuchi, Toshihiko; Yamamoto, Hiroshi

PATENT ASSIGNEE(S): Asahi Glass Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 20 pp.
CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2005008878	A	20050113	JP 2004-158013	200405 27

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PRIORITY APPLN. INFO.: JP 2003-152193 A 200305 29

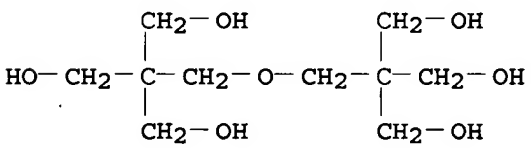
<--

AB The compns. contain radiation-curable monomers 100, lubricants 0.01-10, radiation-sensitive initiators 0.1-10, colloidal silica 0.1-500 parts as solids content, and ≥1 organic solvents having b.p. 100-200°, where the lubricants bear radiation-curable functional groups, ≥1 groups chosen from (SiR1R2O)m, (CF2CF2O)n, [CF2CF(CF3)O]p, [(CF2)3O]q, and (CF2O)r [R1, R2 = C1-8 (fluoro)alkyl, Ph; m = 1-1000; n, p, q, r = 1-100], and ≥1 groups chosen from C6-20 alkylene, [(CH2)2O]x(CH2CHMeO)y, and (COCuH2uO)t (x, y = 0-100; x + y = 5-100; u = 3-5; t = 1-20). Thus, a composition containing dipentaerythritol polyacrylate-HDI copolymer 80, X 22-170BX (OH-terminated dimethylsilicone oil)-ε-caprolactone diblock copolymer-2-methacryloyloxyethyl isocyanate reaction product 1.0, 2-methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one 4.0, colloidal silica coated with 3-metcaptopropyltrimethoxysilane hydrolyzate 75.0, and isopentyl acetate 130.0 g was applied on an aromatic polycarbonate sheet, dried, and irradiated with UV to give a hard coating.

IT **126-58-9DP**, Dipentaerythritol, polyacrylate, polymer with HDI
RL: IMF (Industrial manufacture); POF (Polymer in formulation); **RCT (Reactant)**; TEM (Technical or engineered material use); PREP (Preparation); **RACT (Reactant or reagent)**; USES (Uses)
(recyclable radiation-curable hard coating compns. showing good abrasion resistance and lubricity for plastic moldings)

RN 126-58-9 HCAPLUS

CN 1,3-Propanediol, 2,2'-[oxybis(methylene)]bis[2-(hydroxymethyl)- (9CI) (CA INDEX NAME)



IC ICM C09D004-00
ICS B32B027-08; C09D007-12; C09D167-04; C09D171-00; C09D183-04
CC 42-10 (Coatings, Inks, and Related Products)
Section cross-reference(s): 38
ST radiation curable colloidal silica coating lubricity; methacrylyloethyl terminated polysiloxane **polyester** lubricant coating; isopentyl acetate solvent colloidal silica coating; abrasion resistance radiation curable polyurethane acrylate coating; molded plastic colloidal silica hard coating lubricity; polycarbonate sheet colloidal silica hard coating
IT Polysiloxanes, uses
RL: IMF (Industrial manufacture); POF (Polymer in formulation); RCT (Reactant); TEM (Technical or engineered material use); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)
(**polyester**-, block, diblock, methacrylate-terminated, reactive lubricants; recyclable radiation-curable hard coating compns. showing good abrasion resistance and lubricity for plastic moldings)
IT Polyethers, uses
RL: IMF (Industrial manufacture); POF (Polymer in formulation); RCT (Reactant); TEM (Technical or engineered material use); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)
(**polyester**-, fluorine-containing, block, diblock, methacrylate-terminated, reactive lubricants; recyclable radiation-curable hard coating compns. showing good abrasion resistance and lubricity for plastic moldings)
IT **Fluoropolymers**, uses
RL: IMF (Industrial manufacture); POF (Polymer in formulation); RCT (Reactant); TEM (Technical or engineered material use); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)
(**polyester**-polyether-, block, diblock, methacrylate-terminated, reactive lubricants; recyclable radiation-curable hard coating compns. showing good abrasion resistance and lubricity for plastic moldings)
IT **Polyesters**, uses
RL: IMF (Industrial manufacture); POF (Polymer in formulation); RCT (Reactant); TEM (Technical or engineered material use); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)
(polyether-, fluorine-containing, block, diblock, methacrylate-terminated, reactive lubricants; recyclable radiation-curable hard coating compns. showing good abrasion resistance and lubricity for plastic moldings)
IT **Polyesters**, uses
RL: IMF (Industrial manufacture); POF (Polymer in formulation); RCT (Reactant); TEM (Technical or engineered material use); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)
(siloxane-, block, diblock, methacrylate-terminated, reactive lubricants; recyclable radiation-curable hard coating compns. showing good abrasion resistance and lubricity for plastic moldings)
IT 502-44-3DP, ε-Caprolactone, diblock copolymer with hydroxy-terminated **perfluoropolyether**, reaction product with methacryloyloxyethyl isocyanate 37541-11-0DP, fluorinated 819850-20-9DP, reaction products with 2-methacryloyloxyethyl isocyanate
RL: IMF (Industrial manufacture); POF (Polymer in formulation); RCT (Reactant); TEM (Technical or engineered material use); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)
(reactive lubricant; recyclable radiation-curable hard coating

compns. showing good abrasion resistance and lubricity for plastic moldings)

IT 30674-80-7DP, 2-Methacryloyloxyethyl isocyanate, reaction products with diblock polysiloxane-**polyester** or diblock **perfluoro-polyether-polyester**
RL: IMF (Industrial manufacture); POF (Polymer in formulation); RCT (Reactant); TEM (Technical or engineered material use); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)
(reactive lubricants; recyclable radiation-curable hard coating compns. showing good abrasion resistance and lubricity for plastic moldings)

IT **126-58-9DP**, Dipentaerythritol, polyacrylate, polymer with HDI 822-06-0DP, Hexamethylene diisocyanate, polymer with dipentaerythritol polyacrylate
RL: IMF (Industrial manufacture); POF (Polymer in formulation); **RCT (Reactant)**; TEM (Technical or engineered material use); PREP (Preparation); **RACT (Reactant or reagent)**; USES (Uses)
(recyclable radiation-curable hard coating compns. showing good abrasion resistance and lubricity for plastic moldings)

IT 2641-34-1 9004-74-4, **Polyethylene** glycol monomethyl ether
RL: RCT (Reactant); RACT (Reactant or reagent)
(recyclable radiation-curable hard coating compns. showing good abrasion resistance and lubricity for plastic moldings)

L45 ANSWER 2 OF 14 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:825103 HCAPLUS
DOCUMENT NUMBER: 141:316971
TITLE: Lubricant grease for low and high temperature
INVENTOR(S): Asao, Mitsunari; Egami, Masaki
PATENT ASSIGNEE(S): Japan
SOURCE: U.S. Pat. Appl. Publ., 8 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2004198612	A1	20041007	US 2004-820311 <--	20040408
JP 2004346298	A	20041209	JP 2004-3571 <--	20040109
DE 102004019872	A1	20041118	DE 2004-102004019872 <--	20040423
JP 2006045577	A	20060216	JP 2005-249580 <--	20050830
PRIORITY APPLN. INFO.:			JP 2003-125657 A	200304

30

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JP 2004-3571 A

200401

09

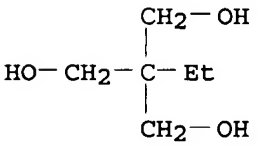
OTHER SOURCE(S): MARPAT 141:316971

AB A rolling bearing, for application in elec. auxiliaries for a car, durable owing to high resistance to high temps. and capable of restraining noises from being generated at low temps.; and lubricant grease, for low and high temperature application, which can be sealed in the rolling bearing. The lubricant grease includes 100 parts by weight of a mixture of fluorine-containing lubricant grease containing **perfluoropolyether** oil as a base oil thereof and **fluorocarbon resin** powder as a thickening agent thereof and urea-containing lubricant grease containing **polyester** oil as a base oil thereof and a urea compound as a thickening agent thereof; and 3 to 30 parts by weight of **polyolefin** oil added to the mixed grease. The **polyolefin** oil has a pour point of not more than -50°. and a kinematic viscosity of 10 to 70 mm 2 /s at 40°.

IT **77-99-6**, Trimethylolpropane **115-77-5**, Pentaerythritol, reactions **126-58-9**
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(lubricant grease for low and high temperature suitable for use in rolling bearings in elec. auxiliaries for cars)

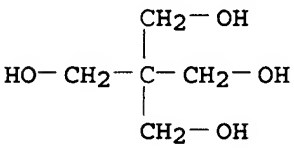
RN 77-99-6 HCAPLUS

CN 1,3-Propanediol, 2-ethyl-2-(hydroxymethyl)- (CA INDEX NAME)



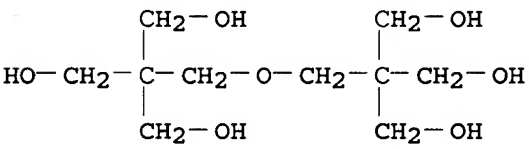
RN 115-77-5 HCAPLUS

CN 1,3-Propanediol, 2,2-bis(hydroxymethyl)- (CA INDEX NAME)



RN 126-58-9 HCAPLUS

CN 1,3-Propanediol, 2,2'-[oxybis(methylene)]bis[2-(hydroxymethyl)- (9CI) (CA INDEX NAME)

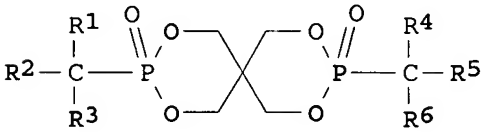


IC ICM C10M111-04
ICS C10M123-04
INCL 508182000; 508485000; 508496000; 508552000; 508582000
CC 51-8 (Fossil Fuels, Derivatives, and Related Products)
IT **Fluoropolymers**, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(**polyether-**, **perfluoro**; lubricant grease for low and high temperature suitable for use in rolling bearings in elec. auxiliaries for cars)
IT **Fluoropolymers**, uses
RL: MOA (Modifier or additive use); USES (Uses)
(thickening agents; lubricant grease for low and high temperature suitable for use in rolling bearings in elec. auxiliaries for cars)
IT **77-99-6**, Trimethylolpropane 101-68-8, Diphenylmethane diisocyanate 106-49-0, p-Toluidine, reactions 111-86-4, Octylamine **115-77-5**, Pentaerythritol, reactions **126-58-9**
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(lubricant grease for low and high temperature suitable for use in rolling bearings in elec. auxiliaries for cars)

L45 ANSWER 3 OF 14 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:139336 HCAPLUS
DOCUMENT NUMBER: 140:182448
TITLE: Halogen-free fire-resistant aromatic **polyester**-based resin compositions and their moldings
INVENTOR(S): Yamanaka, Katsuhiro; Taketani, Yutaka
PATENT ASSIGNEE(S): Teijin Chemicals Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 37 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004051917	A	20040219	JP 2002-214951	200207 24
			<--	
PRIORITY APPLN. INFO.:			JP 2002-214951	200207 24
			<--	

OTHER SOURCE(S): MARPAT 140:182448
GI



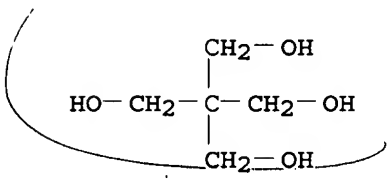
I

AB Title compns., also having good hydrolysis resistance, comprise 100 parts resins containing ≥60% aromatic **polyesters**, 1-100 parts organic phosphates I [R1, R4 = H, C1-5 aliphatic hydrocarbyl, (substituted) Ph, (substituted) naphthyl, (substituted) anthryl; R2, R3, R5, R6 = (substituted) Ph, (substituted) naphthyl, (substituted) anthryl], 0.1-100 parts alkali and/or alkaline earth metal salts, 0-50 parts fireproof improver resins, and 0-200 parts fillers. A composition containing TRB-H 100, 2,4,8,10-tetraoxa-3,9-diphosphaspiro[5,5]undecane 3,9-bis(diphenylmethyl)-3,9-dioxide (prepared from diphenylmethylphosphonic dichloride and pentaerythritol) 15, and CaCO3 5 parts was extruded and molded into a test piece showing UL94 test (for 1.6-mm thickness) V-0 and flexural strength retention ≥70% after 24 h under 120° and 100% relative humidity.

IT **115-77-5**, Pentaerythritol, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(diphosphaspiro compound- and alkali (or alkaline earth) salt-containing aromatic **polyester**-based compns. with fire and hydrolysis resistance)

RN 115-77-5 HCAPLUS

CN 1,3-Propanediol, 2,2-bis(hydroxymethyl)- (CA INDEX NAME)



IC ICM C08L067-00
ICS C08J005-00; C08K003-00; C08K003-24; C08K005-5357; C08L101-00

CC 37-6 (Plastics Manufacture and Processing)

ST hydrolysis resistance fireproof arom **polyester** compn pentaerythritol diphenylmethylphosphonate; alkali metal salt diphosphaspiro compd fireproof arom **polyester** compn; alk earth salt diphosphaspiro compd fireproof arom **polyester** compn

IT Glass fibers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(ECS 03T187H; diphosphaspiro compound- and alkali (or alkaline earth) salt-containing aromatic **polyester**-based compns. with fire and hydrolysis resistance)

IT **Polyesters**, uses
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(TR 8580H, TR 8550T; diphosphaspiro compound- and alkali (or alkaline earth) salt-containing aromatic **polyester**-based compns. with fire and hydrolysis resistance)

IT **Polyesters**, uses
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(aromatic; diphosphaspiro compound- and alkali (or alkaline earth) salt-containing aromatic **polyester**-based compns. with fire and hydrolysis resistance)

IT Fillers
(diphosphaspiro compound- and alkali (or alkaline earth) salt-containing aromatic **polyester**-based compns. with fire and hydrolysis resistance)

IT Epoxy resins, uses
Fluoropolymers, uses
Fluoropolymers, uses
Phenolic resins, uses
Polyamides, uses
Polyamides, uses
Polycarbonates, uses
Polyesters, uses
Polyolefins
Polyoxyphenylenes
Polythiophenylenes
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(diphosphaspiro compound- and alkali (or alkaline earth) salt-containing aromatic **polyester**-based compns. with fire and hydrolysis resistance)

IT Alkali metal salts
Alkaline earth salts
Carbonates, uses
Polymer blends
RL: TEM (Technical or engineered material use); USES (Uses)
(diphosphaspiro compound- and alkali (or alkaline earth) salt-containing aromatic **polyester**-based compns. with fire and hydrolysis resistance)

IT Water-resistant materials
(fire-resistant; diphosphaspiro compound- and alkali (or alkaline earth) salt-containing aromatic **polyester**-based compns. with fire and hydrolysis resistance)

IT Polyimides, uses
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(polyether-; diphosphaspiro compound- and alkali (or alkaline earth) salt-containing aromatic **polyester**-based compns. with fire and hydrolysis resistance)

IT Polyethers, uses
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(polyimide-; diphosphaspiro compound- and alkali (or alkaline earth) salt-containing aromatic **polyester**-based compns. with fire and hydrolysis resistance)

IT Fire-resistant materials
(water-resistant; diphosphaspiro compound- and alkali (or alkaline earth) salt-containing aromatic **polyester**-based compns. with fire and hydrolysis resistance)

IT 25038-59-9, TR 8580H, uses
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(TR 8580H, TR 8550T; diphosphaspiro compound- and alkali (or alkaline earth) salt-containing aromatic **polyester**-based compns. with fire and hydrolysis resistance)

IT 24968-12-5, TRB-H
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(TRB-H, TRB-J; diphosphaspiro compound- and alkali (or alkaline earth) salt-containing aromatic **polyester**-based compns. with fire and hydrolysis resistance)

IT 9020-32-0 9052-39-5, Cyclohexanedimethanol-terephthalic acid copolymer 25134-01-4, 2,6-Xylenol homopolymer 25971-63-5, Bisphenol A-phosgene copolymer 26062-94-2, 1,4-Butylene glycol-terephthalic acid copolymer 26590-75-0, Trimethylene

glycol-terephthalic acid copolymer 52309-38-3 262266-43-3
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(assumed monomers; diphosphaspiro compound- and alkali (or alkaline earth) salt-containing aromatic **polyester**-based compns. with fire and hydrolysis resistance)

IT 475101-76-9P, 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5,5]undecane 3,9-bis(diphenylmethyl)-3,9-dioxide
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); PREP (Preparation); USES (Uses)
(diphosphaspiro compound- and alkali (or alkaline earth) salt-containing aromatic **polyester**-based compns. with fire and hydrolysis resistance)

IT 9002-84-0, Polyflon MPA FA 500 9020-73-9, **Poly(ethylene** naphthalate) 9053-81-0 24936-68-3, Panlite L 1225WP, uses 24938-67-8, Xyron P 402 25038-54-4, NF 8020, uses 26546-03-2, Poly(trimethylene terephthalate) 51806-50-9, **Poly(butylene** naphthalate) 106677-58-1, Santac UT 61 262371-02-8 347145-17-9, Blendex 449
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(diphosphaspiro compound- and alkali (or alkaline earth) salt-containing aromatic **polyester**-based compns. with fire and hydrolysis resistance)

IT **115-77-5**, Pentaerythritol, reactions 776-74-9, Diphenylmethyl bromide 54767-39-4, (Diphenylmethyl)phosphonic dichloride 475101-77-0, 3,9-Bis(diphenylmethoxy)-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5,5]undecane
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(diphosphaspiro compound- and alkali (or alkaline earth) salt-containing aromatic **polyester**-based compns. with fire and hydrolysis resistance)

IT 471-34-1, Calcium carbonate, uses 513-77-9, Barium carbonate 546-93-0, Magnesium carbonate 7758-87-4, Calcium phosphate 25068-38-6, Epikote 828 99752-88-2, Sumilit PR 53195 878558-04-4, PFE 301S
RL: TEM (Technical or engineered material use); USES (Uses)
(diphosphaspiro compound- and alkali (or alkaline earth) salt-containing aromatic **polyester**-based compns. with fire and hydrolysis resistance)

L45 ANSWER 4 OF 14 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:139335 HCAPLUS
DOCUMENT NUMBER: 140:182447
TITLE: Halogen-free fire-resistant aromatic **polyester**-based resin compositions and their moldings
INVENTOR(S): Yamanaka, Katsuhiro; Taketani, Yutaka
PATENT ASSIGNEE(S): Teijin Chemicals Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 36 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004051916	A	20040219	JP 2002-214950	

200207
24
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PRIORITY APPLN. INFO.: JP 2002-214950

200207
24
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OTHER SOURCE(S): MARPAT 140:182447

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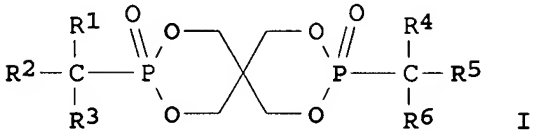


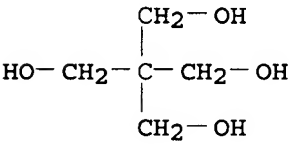
I

AB Title compns., also having good hydrolysis resistance, comprise 100 parts resins containing ≥60% aromatic **polyesters**, 1-100 parts organic phosphates I [R1, R4 = H, C1-5 aliphatic hydrocarbyl; R3, R6 = C1-5 aliphatic hydrocarbyl; R2, R5 = (substituted) Ph, (substituted) naphthyl, (substituted) anthryl], 0.1-100 parts alkali and/or alkaline earth metal salts, 0-50 parts fireproof improver resins, and 0-200 parts fillers. A composition containing TRB-H 100, 2,4,8,10-tetraoxa-3,9-diphosphaspiro[5,5]undecane 3,9-di-α-methylbenzyl-3,9-dioxide (prepared from pentaerythritol, PCl3, and 1-phenylethyl bromide) 15, and CaCO3 5 parts was extruded and molded into a test piece showing UL94 test (for 1.6-mm thickness) V-0 and flexural strength retention ≥70% after 24 h under 120° and 100% relative humidity.

IT **115-77-5**, Pentaerythritol, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(diphosphaspiro compound- and alkali (or alkaline earth) salt-containing aromatic **polyester**-based compns. with fire and hydrolysis resistance)

RN 115-77-5 HCAPLUS

CN 1,3-Propanediol, 2,2-bis(hydroxymethyl)- (CA INDEX NAME)



IC ICM C08L067-00
ICS C08J005-00; C08K003-00; C08K003-24; C08K005-5357; C08L101-00

CC 37-6 (Plastics Manufacture and Processing)

ST hydrolysis resistance fireproof arom **polyester** compn pentaerythritol dimethylbenzylphosphonate; alkali metal salt diphosphaspiro compd fireproof arom **polyester** compn; alk earth salt diphosphaspiro compd fireproof arom **polyester** compn

IT Glass fibers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(ECS 03T187H; diphosphaspiro compound- and alkali (or alkaline earth) salt-containing aromatic **polyester**-based compns. with fire and hydrolysis resistance)

IT **Polyesters**, uses
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(aromatic; diphosphaspiro compound- and alkali (or alkaline earth) salt-containing aromatic **polyester**-based compns. with fire and hydrolysis resistance)

IT Fillers
(diphosphaspiro compound- and alkali (or alkaline earth) salt-containing aromatic **polyester**-based compns. with fire and hydrolysis resistance)

IT Epoxy resins, uses
Fluoropolymers, uses
Fluoropolymers, uses
Phenolic resins, uses
Polyamides, uses
Polyamides, uses
Polycarbonates, uses
Polyesters, uses
Polyolefins
Polyoxyphenylenes
Polythiophenylenes
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(diphosphaspiro compound- and alkali (or alkaline earth) salt-containing aromatic **polyester**-based compns. with fire and hydrolysis resistance)

IT Alkali metal salts
Alkaline earth salts
Carbonates, uses
Polymer blends
RL: TEM (Technical or engineered material use); USES (Uses)
(diphosphaspiro compound- and alkali (or alkaline earth) salt-containing aromatic **polyester**-based compns. with fire and hydrolysis resistance)

IT Water-resistant materials
(fire-resistant; diphosphaspiro compound- and alkali (or alkaline earth) salt-containing aromatic **polyester**-based compns. with fire and hydrolysis resistance)

IT Polyimides, uses
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(polyether-; diphosphaspiro compound- and alkali (or alkaline earth) salt-containing aromatic **polyester**-based compns. with fire and hydrolysis resistance)

IT Polyethers, uses
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(polyimide-; diphosphaspiro compound- and alkali (or alkaline earth) salt-containing aromatic **polyester**-based compns. with fire and hydrolysis resistance)

IT Fire-resistant materials
(water-resistant; diphosphaspiro compound- and alkali (or alkaline earth) salt-containing aromatic **polyester**-based compns. with fire and hydrolysis resistance)

IT 25038-59-9, uses
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(TR 8580H, TR 8550T; diphosphaspiro compound- and alkali (or alkaline earth) salt-containing aromatic **polyester**-based compns. with fire and hydrolysis resistance)

IT 24968-12-5
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(TRB-H, TRB-J; diphosphaspiro compound- and alkali (or alkaline earth) salt-containing aromatic **polyester**-based compns. with fire and hydrolysis resistance)

IT 9020-32-0 9052-39-5, Cyclohexanedimethanol-terephthalic acid copolymer 25134-01-4, 2,6-Xylenol homopolymer 25971-63-5, Bisphenol A-phosgene copolymer 26062-94-2, 1,4-Butylene glycol-terephthalic acid copolymer 26590-75-0, Trimethylene glycol-terephthalic acid copolymer 52309-38-3 262266-43-3
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(assumed monomers; diphosphaspiro compound- and alkali (or alkaline earth) salt-containing aromatic **polyester**-based compns. with fire and hydrolysis resistance)

IT 475101-74-7P
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); PREP (Preparation); USES (Uses)
(diphosphaspiro compound- and alkali (or alkaline earth) salt-containing aromatic **polyester**-based compns. with fire and hydrolysis resistance)

IT 947-28-4P
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(diphosphaspiro compound- and alkali (or alkaline earth) salt-containing aromatic **polyester**-based compns. with fire and hydrolysis resistance)

IT 9002-84-0, Polyflon MPA FA 500 9020-73-9, **Poly(ethylene** naphthalate) 9053-81-0, Cyclohexanedimethanol-terephthalic acid copolymer, sru 24936-68-3, Panlite L 1225WP, uses 24938-67-8, Xyron P 402 25038-54-4, NF 8020, uses 26546-03-2, Poly(trimethylene terephthalate) 51806-50-9, **Poly(butylene** naphthalate) 106677-58-1, Santac UT 61 262371-02-8 347145-17-9, Blendex 449
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(diphosphaspiro compound- and alkali (or alkaline earth) salt-containing aromatic **polyester**-based compns. with fire and hydrolysis resistance)

IT **115-77-5**, Pentaerythritol, reactions 585-71-7, 1-Phenylethyl bromide 7719-12-2, Phosphorous trichloride
RL: **RCT (Reactant); RACT (Reactant or reagent)**
(diphosphaspiro compound- and alkali (or alkaline earth) salt-containing aromatic **polyester**-based compns. with fire and hydrolysis resistance)

IT 471-34-1, Calcium carbonate, uses 513-77-9, Barium carbonate 546-93-0, Magnesium carbonate 7758-87-4, Calcium phosphate 25068-38-6, Epikote 828 99752-88-2, Sumilit PR 53195 878558-04-4, PFE 301S
RL: TEM (Technical or engineered material use); USES (Uses)
(diphosphaspiro compound- and alkali (or alkaline earth) salt-containing aromatic **polyester**-based compns. with fire and hydrolysis resistance)

L45 ANSWER 5 OF 14 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:139266 HCAPLUS
DOCUMENT NUMBER: 140:182441
TITLE: Halogen-free fire-resistant polymer compositions and their moldings with good hydrolysis

resistance
INVENTOR(S): Yamanaka, Katsuhiro; Taketani, Yutaka
PATENT ASSIGNEE(S): Teijin Chemicals Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 37 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004051819	A	20040219	JP 2002-212260	20020722
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PRIORITY APPLN. INFO.:			JP 2002-212260	20020722
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OTHER SOURCE(S): MARPAT 140:182441
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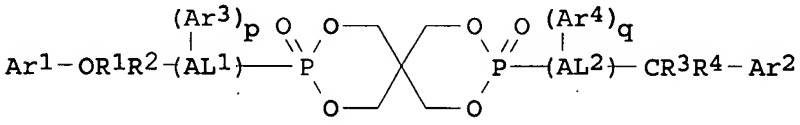
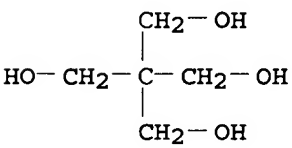


I

AB The compns. comprise (a) 100 parts polymers containing ≥60% aromatic **polyesters**, (b) 1-100 parts organic P compds. I [Ar1, Ar2 = (substituted) Ph, naphthyl, anthryl; R1-R4 = H, C1-5 aliphatic hydrocarbon group, (substituted) Ph, naphthyl, anthryl; AL1, AL2 = C1-5 aliphatic hydrocarbon group; Ar3, Ar4 = (substituted) Ph, naphthyl, anthryl; p, q = 0-3], (c) 0.1-100 parts alkali metal salts and/or alkaline earth metal salts, (d) 0-50 parts fire resistance-improving polymers, (e) 0-200 parts fillers, and optionally (f) 0.01-10 parts **fluoropolymers.** Thus, a composition containing TRB H (**polybutylene** terephthalate) 100, 3,9-bis(2-phenylethyl)-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane-3,9-dioxide 15, and CaCO3 5 parts was injection-molded to give a test piece showing UL-94 rating V-0 (thickness 1.6 mm).

IT **115-77-5**, Pentaerythritol, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(preparation of P-containing fireproofing agents for aromatic **polyester** moldings with good hydrolysis resistance)

RN 115-77-5 HCAPLUS
CN 1,3-Propanediol, 2,2-bis(hydroxymethyl)- (CA INDEX NAME)



IC ICM C08L067-02
ICS C08J005-00; C08K003-00; C08K005-5357; C08L025-00; C08L027-12; C08L061-06; C08L063-00
CC 37-6 (Plastics Manufacture and Processing)
Section cross-reference(s): 38
ST fireproofing phenylethyl phosphaspiro undecane oxide polymer compn; **polyester** alkali metal salt **fluoropolymer**
fireproofing molding; alk earth metal salt **polyester**
fireproofing molding; **polybutylene** terephthalate polymer
calcium carbonate molding
IT **Polyesters**, uses
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(TR 8580H, TR 8550T; halogen-free fire-resistant aromatic **polyester** compns. containing specific P compds. for moldings with good hydrolysis resistance)
IT Epoxy resins, uses
Phenolic resins, uses
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(fire resistance improvers; halogen-free fire-resistant aromatic **polyester** compns. containing specific P compds. for moldings with good hydrolysis resistance)
IT **Fluoropolymers**, uses
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(fireproofing agent; halogen-free fire-resistant aromatic **polyester** compns. containing specific P compds. for moldings with good hydrolysis resistance)
IT **Fluoropolymers**, uses
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(fireproofing agents; halogen-free fire-resistant aromatic **polyester** compns. containing specific P compds. for moldings with good hydrolysis resistance)
IT Fire-resistant materials
Fireproofing agents
(halogen-free fire-resistant aromatic **polyester** compns. containing specific P compds. for moldings with good hydrolysis resistance)
IT Alkali metal salts
Alkaline earth salts
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(halogen-free fire-resistant aromatic **polyester** compns. containing specific P compds. for moldings with good hydrolysis resistance)
IT Polyamides, uses
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(halogen-free fire-resistant aromatic **polyester** compns. containing specific P compds. for moldings with good hydrolysis resistance)
IT Polycarbonates, uses
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(halogen-free fire-resistant aromatic **polyester** compns. containing specific P compds. for moldings with good hydrolysis resistance)

IT **Polyesters**, uses
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(halogen-free fire-resistant aromatic **polyester** compns. containing specific P compds. for moldings with good hydrolysis resistance)

IT **Polyolefins**
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(halogen-free fire-resistant aromatic **polyester** compns. containing specific P compds. for moldings with good hydrolysis resistance)

IT Polyoxyphenylenes
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(halogen-free fire-resistant aromatic **polyester** compns. containing specific P compds. for moldings with good hydrolysis resistance)

IT Polythiophenylenes
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(halogen-free fire-resistant aromatic **polyester** compns. containing specific P compds. for moldings with good hydrolysis resistance)

IT Molded plastics, uses
Polymer blends
RL: TEM (Technical or engineered material use); USES (Uses)
(halogen-free fire-resistant aromatic **polyester** compns. containing specific P compds. for moldings with good hydrolysis resistance)

IT Polyimides, uses
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(polyether-; halogen-free fire-resistant aromatic **polyester** compns. containing specific P compds. for moldings with good hydrolysis resistance)

IT Polyethers, uses
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(polyimide-; halogen-free fire-resistant aromatic **polyester** compns. containing specific P compds. for moldings with good hydrolysis resistance)

IT 9003-54-7, Acrylonitrile-styrene copolymer
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(PTFE coated with, fireproofing agent; halogen-free fire-resistant aromatic **polyester** compns. containing specific P compds. for moldings with good hydrolysis resistance)

IT 25038-59-9, **Poly(ethylene** terephthalate), uses
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(TR 8580H, TR 8550T; halogen-free fire-resistant aromatic **polyester** compns. containing specific P compds. for moldings with good hydrolysis resistance)

IT 24968-12-5, **Poly(butylene** terephthalate)
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(TRB H, TRB J; halogen-free fire-resistant aromatic **polyester** compns. containing specific P compds. for moldings with good hydrolysis resistance)

IT 26062-94-2, **Poly(butylene** terephthalate)
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(assumed monomers, TRB H, TRB J; halogen-free fire-resistant aromatic **polyester** compns. containing specific P compds. for moldings with good hydrolysis resistance)

IT 25037-45-0, Bisphenol A-carbonic acid copolymer 25037-99-4, 1,4-Cyclohexanedimethanol-terephthalic acid polymer 25134-01-4, 2,6-Xylenol homopolymer 25230-87-9, Ethylene glycol-2,6-naphthalenedicarboxylic acid copolymer 26590-75-0, Poly(trimethylene terephthalate) 28601-83-4, 2,6-Naphthalenedicarboxylic acid-1,3-propanediol polymer 28605-06-3, 1,4-Butanediol-2,6-naphthalenedicarboxylic acid copolymer
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(assumed monomers; halogen-free fire-resistant aromatic **polyester** compns. containing specific P compds. for moldings with good hydrolysis resistance)

IT 25068-38-6, Epikote 828 99752-88-2, PR 53195
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(fire resistance improver; halogen-free fire-resistant aromatic **polyester** compns. containing specific P compds. for moldings with good hydrolysis resistance)

IT 9002-84-0, Polyflon MPA FA 500 347145-17-9, Blendex 449
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(fireproofing agent; halogen-free fire-resistant aromatic **polyester** compns. containing specific P compds. for moldings with good hydrolysis resistance)

IT 62284-92-8P, 3,9-Bis(2-phenylethyl)-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane-3,9-dioxide
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(fireproofing agent; preparation of P-containing fireproofing agents for aromatic **polyester** moldings with good hydrolysis resistance)

IT 471-34-1, Calcium carbonate, uses 513-77-9, Barium carbonate 546-93-0, Magnesium carbonate 7758-87-4, Calcium phosphate
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(halogen-free fire-resistant aromatic **polyester** compns. containing specific P compds. for moldings with good hydrolysis resistance)

IT 24936-68-3, Panlite L 1225WP, uses 24936-69-4, Poly(1,4-cyclohexanedimethanol terephthalate) 24938-67-8, Xyron P 402 24968-11-4, **Poly(ethylene** naphthalate) 25038-54-4, NF 8020, uses 26546-03-2, Poly(trimethylene terephthalate) 28779-81-9, 2,6-Naphthalenedicarboxylic acid-1,3-propanediol copolymer, sru 28779-82-0, **Poly(butylene** naphthalate) 106677-58-1, Santac UT 61
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(halogen-free fire-resistant aromatic **polyester** compns. containing specific P compds. for moldings with good hydrolysis resistance)

IT 27198-72-7P
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)

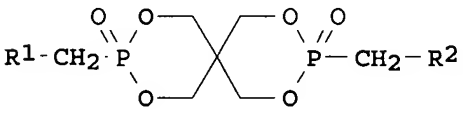
(preparation of P-containing fireproofing agents for aromatic **polyester** moldings with good hydrolysis resistance)

IT 103-63-9, (2-Bromoethyl)benzene **115-77-5**, Pentaerythritol, reactions 7719-12-2, Phosphorus trichloride 475101-75-8, 3,9-Di(2-phenylethoxy)-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(preparation of P-containing fireproofing agents for aromatic **polyester** moldings with good hydrolysis resistance)

L45 ANSWER 6 OF 14 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:139265 HCAPLUS
DOCUMENT NUMBER: 140:182440
TITLE: Halogen-free fire-resistant polymer compositions and their moldings with good hydrolysis resistance
INVENTOR(S): Yamanaka, Katsuhiro; Taketani, Yutaka
PATENT ASSIGNEE(S): Teijin Chemicals Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 36 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004051818	A	20040219	JP 2002-212259	20020722 <--

PRIORITY APPLN. INFO.: JP 2002-212259 20020722 <--
OTHER SOURCE(S): MARPAT 140:182440
GI

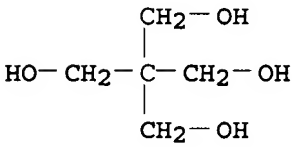


I

AB The compns. comprise (a) 100 parts polymers containing ≥60% aromatic **polyesters**, (b) 1-100 parts organic P compds. I [R1, R2 = (substituted) Ph, naphthyl, anthryl], (c) 0.1-100 parts alkali metal salts and/or alkaline earth metal salts, (d) 0-50 parts fire resistance-improving polymers, (e) 0-200 parts fillers, and optionally (f) 0.01-10 parts **fluoropolymers**. Thus, a composition containing TRB H (**polybutylene** terephthalate) 100, 3,9-dibenzyl-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane-3,9-dioxide 15, and CaCO3 5 parts was injection-molded to give a test piece showing UL-94 rating V-0 (thickness 1.6 mm).

IT **115-77-5**, Pentaerythritol, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(preparation of P-containing fireproofing agents for aromatic

polyester moldings with good hydrolysis resistance)
RN 115-77-5 HCAPLUS
CN 1,3-Propanediol, 2,2-bis(hydroxymethyl)- (CA INDEX NAME)



IC ICM C08L067-02
ICS C08J005-00; C08K003-00; C08K005-5357; C08L025-00; C08L027-12; C08L061-06; C08L063-00
CC 37-6 (Plastics Manufacture and Processing)
Section cross-reference(s): 38
ST fireproofing benzyl phosphaspiro undecane oxide polymer compn; **polyester** alkali metal salt **fluoropolymer** fireproofing molding; alk earth metal salt **polyester** fireproofing molding; **polybutylene** terephthalate polymer calcium carbonate molding
IT **Polyesters**, uses
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(TR 8580H, TR 8550T; halogen-free fire-resistant aromatic **polyester** compns. containing specific P compds. for moldings with good hydrolysis resistance)
IT Epoxy resins, uses
Phenolic resins, uses
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(fire resistance improvers; halogen-free fire-resistant aromatic **polyester** compns. containing specific P compds. for moldings with good hydrolysis resistance)
IT **Fluoropolymers**, uses
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(fireproofing agent; halogen-free fire-resistant aromatic **polyester** compns. containing specific P compds. for moldings with good hydrolysis resistance)
IT **Fluoropolymers**, uses
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(fireproofing agents; halogen-free fire-resistant aromatic **polyester** compns. containing specific P compds. for moldings with good hydrolysis resistance)
IT Fire-resistant materials
Fireproofing agents
(halogen-free fire-resistant aromatic **polyester** compns. containing specific P compds. for moldings with good hydrolysis resistance)
IT Alkali metal salts
Alkaline earth salts
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(halogen-free fire-resistant aromatic **polyester** compns. containing specific P compds. for moldings with good hydrolysis resistance)
IT Polyamides, uses

RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(halogen-free fire-resistant aromatic **polyester** compns. containing specific P compds. for moldings with good hydrolysis resistance)

IT Polycarbonates, uses
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(halogen-free fire-resistant aromatic **polyester** compns. containing specific P compds. for moldings with good hydrolysis resistance)

IT **Polyesters**, uses
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(halogen-free fire-resistant aromatic **polyester** compns. containing specific P compds. for moldings with good hydrolysis resistance)

IT **Polyolefins**
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(halogen-free fire-resistant aromatic **polyester** compns. containing specific P compds. for moldings with good hydrolysis resistance)

IT Polyoxyphenylenes
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(halogen-free fire-resistant aromatic **polyester** compns. containing specific P compds. for moldings with good hydrolysis resistance)

IT Polythiophenylenes
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(halogen-free fire-resistant aromatic **polyester** compns. containing specific P compds. for moldings with good hydrolysis resistance)

IT Molded plastics, uses
Polymer blends
RL: TEM (Technical or engineered material use); USES (Uses)
(halogen-free fire-resistant aromatic **polyester** compns. containing specific P compds. for moldings with good hydrolysis resistance)

IT Polyimides, uses
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(polyether-; halogen-free fire-resistant aromatic **polyester** compns. containing specific P compds. for moldings with good hydrolysis resistance)

IT Polyethers, uses
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(polyimide-; halogen-free fire-resistant aromatic **polyester** compns. containing specific P compds. for moldings with good hydrolysis resistance)

IT 9003-54-7, Acrylonitrile-styrene copolymer
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(PTFE coated with, fireproofing agent; halogen-free fire-resistant aromatic **polyester** compns. containing specific P compds. for moldings with good hydrolysis resistance)

IT 25038-59-9, **Poly(ethylene** terephthalate), uses

RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(TR 8580H, TR 8550T; halogen-free fire-resistant aromatic **polyester** compns. containing specific P compds. for moldings with good hydrolysis resistance)

IT 24968-12-5, **Poly(butylene** terephthalate)
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(TRB H, TRB J; halogen-free fire-resistant aromatic **polyester** compns. containing specific P compds. for moldings with good hydrolysis resistance)

IT 26062-94-2, **Poly(butylene** terephthalate)
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(assumed monomers, TRB H, TRB J; halogen-free fire-resistant aromatic **polyester** compns. containing specific P compds. for moldings with good hydrolysis resistance)

IT 25037-45-0 25037-99-4, 1,4-Cyclohexanedimethanol-terephthalic acid polymer 25134-01-4 25230-87-9 26590-75-0, Poly(trimethylene terephthalate) 28601-83-4 28605-06-3
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(assumed monomers; halogen-free fire-resistant aromatic **polyester** compns. containing specific P compds. for moldings with good hydrolysis resistance)

IT 25068-38-6, Epikote 828 99752-88-2, PR 53195
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(fire resistance improver; halogen-free fire-resistant aromatic **polyester** compns. containing specific P compds. for moldings with good hydrolysis resistance)

IT 9002-84-0, Polyflon MPA FA 500 347145-17-9, Blendex 449
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(fireproofing agent; halogen-free fire-resistant aromatic **polyester** compns. containing specific P compds. for moldings with good hydrolysis resistance)

IT 20544-37-0P, 3,9-Dibenzyl-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane 3,9-dioxide
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(fireproofing agent; preparation of P-containing fireproofing agents for aromatic **polyester** moldings with good hydrolysis resistance)

IT 471-34-1, Calcium carbonate, uses 513-77-9, Barium carbonate 546-93-0, Magnesium carbonate 7758-87-4, Calcium phosphate
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(halogen-free fire-resistant aromatic **polyester** compns. containing specific P compds. for moldings with good hydrolysis resistance)

IT 24936-68-3, Panlite L 1225WP, uses 24936-69-4, Poly(1,4-cyclohexanedimethanol terephthalate) 24938-67-8, Xyron P 402 24968-11-4, **Poly(ethylene** naphthalate) 25038-54-4, NF 8020, uses 26546-03-2, Poly(trimethylene terephthalate) 28779-81-9, 2,6-Naphthalenedicarboxylic acid-1,3-propanediol copolymer, sru 28779-82-0, **Poly(butylene** naphthalate) 106677-58-1, Santac UT 61
RL: POF (Polymer in formulation); TEM (Technical or engineered

material use); USES (Uses)
(halogen-free fire-resistant aromatic **polyester** compns. containing specific P compds. for moldings with good hydrolysis resistance)

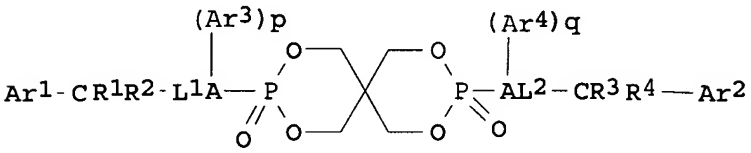
IT 27198-72-7P
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(preparation of P-containing fireproofing agents for aromatic **polyester** moldings with good hydrolysis resistance)

IT 100-39-0, Benzyl bromide **115-77-5**, Pentaerythritol, reactions 7093-28-9, 3,9-Dibenzyloxy-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5,5]undecane 7719-12-2, Phosphorus trichloride
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(preparation of P-containing fireproofing agents for aromatic **polyester** moldings with good hydrolysis resistance)

L45 ANSWER 7 OF 14 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:57585 HCAPLUS
DOCUMENT NUMBER: 140:112503
TITLE: Halogen-free heat- and fire-resistant transparent ABS resin-based compositions containing organophosphorus compounds, and their moldings
INVENTOR(S): Yamanaka, Katsuhiro; Taketani, Yutaka
PATENT ASSIGNEE(S): Teijin Chemicals Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 34 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004018733	A	20040122	JP 2002-177296	200206 18 <--
PRIORITY APPLN. INFO.:			JP 2002-177296	200206 18 <--

OTHER SOURCE(S): MARPAT 140:112503
GI



I

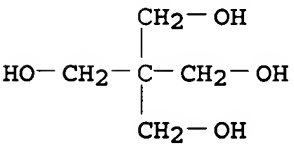
AB Title compns. contain 100 parts polymers containing ≥60% ABS and 1-100 parts organophosphorus compds. I [Ar1-Ar4 = (un)substituted Ph, naphthyl, anthryl; R1-R4 = H, C1-5 aliphatic hydrocarbyl, (un)substituted Ph, naphthyl, anthryl; AL1, AL2 = C1-5 linear or branched aliphatic hydrocarbyl; p, q = 0-3]. Thus, a molding

comprising 100 parts Santac UT 61 (ABS resin) and 15 parts 2,4,8,10-tetraoxa-3,9-diphosphaspiro[5,5]undecane-3,9-di(2-phenylethyl)-3,9-dioxide showed UL-94 flammability rating V-2, heat distortion temperature retention 96%, and no burn marks.

IT **115-77-5**, Pentaerythritol, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(in manufacture of fireproofing agent; heat- and fire-resistant transparent ABS resin-based compns. containing tetraoxadiphosphaspiroundecanes)

RN 115-77-5 HCAPLUS

CN 1,3-Propanediol, 2,2-bis(hydroxymethyl)- (CA INDEX NAME)



IC ICM C08L055-02
ICS C08J005-00; C08K005-5357; C09K021-12; C08L101-00

CC 38-3 (Plastics Fabrication and Uses)
Section cross-reference(s): 29, 37

IT **Polyesters**, uses
RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(aromatic; heat- and fire-resistant transparent ABS resin-based compns. containing tetraoxadiphosphaspiroundecanes)

IT **Fluoropolymers**, uses
RL: MOA (Modifier or additive use); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(heat- and fire-resistant transparent ABS resin-based compns. containing tetraoxadiphosphaspiroundecanes)

IT **Polyesters**, uses
RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(heat- and fire-resistant transparent ABS resin-based compns. containing tetraoxadiphosphaspiroundecanes)

IT **Polyolefins**
RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(heat- and fire-resistant transparent ABS resin-based compns. containing tetraoxadiphosphaspiroundecanes)

IT 103-63-9, 2-Bromoethylbenzene **115-77-5**, Pentaerythritol, reactions 475101-75-8, 3,9-Di(2-phenylethoxy)-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5,5]undecane
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(in manufacture of fireproofing agent; heat- and fire-resistant transparent ABS resin-based compns. containing tetraoxadiphosphaspiroundecanes)

L45 ANSWER 8 OF 14 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:55648 HCAPLUS
DOCUMENT NUMBER: 140:112485
TITLE: Halogen-free heat- and fire-resistant transparent ABS resin-based compositions containing organophosphorus compounds, and their moldings
INVENTOR(S): Yamanaka, Katsuhiro; Taketani, Yutaka

PATENT ASSIGNEE(S): Teijin Chemicals Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 33 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004018734	A	20040122	JP 2002-177297	20020618

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PRIORITY APPLN. INFO.: JP 2002-177297 20020618

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OTHER SOURCE(S): MARPAT 140:112485
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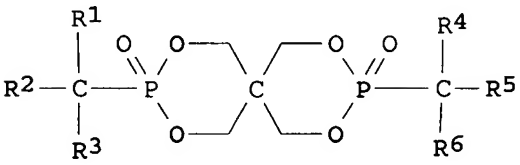
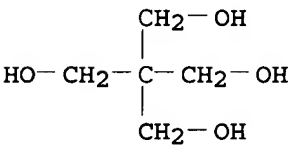


I

AB Title compns. contain 100 parts polymers containing ≥60% ABS and 1-100 parts organophosphorus compds. I [R1, R4 = H, C1-5 aliphatic hydrocarbyl, (un)substituted Ph, naphthyl, anthryl; R2, R3, R5, R6 = (un)substituted Ph, naphthyl, anthryl]. Thus, a molding comprising 100 parts Santac UT 61 (ABS resin) and 15 parts 2,4,8,10-tetraoxa-3,9-diphosphaspiro[5,5]undecane-3,9-bis(diphenylmethyl)-3,9-dioxide showed UL-94 flammability rating V-2, heat distortion temperature retention 98%, and no burn marks.

IT **115-77-5**, Pentaerythritol, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(in manufacture of fireproofing agent; heat- and fire-resistant transparent ABS resin-based compns. containing tetraoxadiphosphaspiroundecanes)

RN 115-77-5 HCAPLUS
CN 1,3-Propanediol, 2,2-bis(hydroxymethyl)- (CA INDEX NAME)



IC ICM C08L055-02
ICS C08J005-00; C08K005-5357; C09K021-12; C08L101-00
CC 38-3 (Plastics Fabrication and Uses)
Section cross-reference(s): 29, 37

IT **Polyesters**, uses
RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(aromatic; heat- and fire-resistant transparent ABS resin-based compns. containing tetraoxadiphosphaspiroundecanes)

IT **Fluoropolymers**, uses
RL: MOA (Modifier or additive use); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(heat- and fire-resistant transparent ABS resin-based compns. containing tetraoxadiphosphaspiroundecanes)

IT **Polyesters**, uses
RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(heat- and fire-resistant transparent ABS resin-based compns. containing tetraoxadiphosphaspiroundecanes)

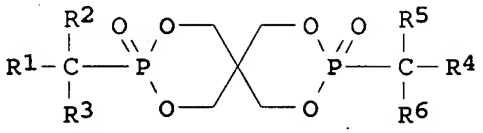
IT **Polyolefins**
RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(heat- and fire-resistant transparent ABS resin-based compns. containing tetraoxadiphosphaspiroundecanes)

IT **115-77-5**, Pentaerythritol, reactions 776-74-9, Diphenylmethyl bromide 54767-39-4, (Diphenylmethyl)phosphonic dichloride 475101-77-0, 3,9-Bis(diphenylmethoxy)-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5,5]undecane
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(in manufacture of fireproofing agent; heat- and fire-resistant transparent ABS resin-based compns. containing tetraoxadiphosphaspiroundecanes)

L45 ANSWER 9 OF 14 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:52945 HCAPLUS
DOCUMENT NUMBER: 140:112462
TITLE: halogen-free heat- and fire-resistant transparent ABS resin-based compositions containing organophosphorus compounds and their moldings
INVENTOR(S): Yamanaka, Katsuhiro; Taketani, Yutaka
PATENT ASSIGNEE(S): Teijin Chemicals Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 33 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004018732	A	20040122	JP 2002-177295	200206 18 <--

PRIORITY APPLN. INFO.: JP 2002-177295 200206 18 <--
OTHER SOURCE(S): MARPAT 140:112462
GI



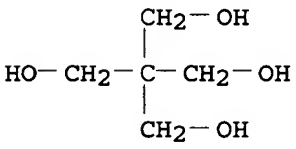
I

AB Title compns. contain 100 parts polymers containing ≥60% ABS and 1-100 parts organophosphorus compds. I [R1, R4 = H, C1-5 aliphatic hydrocarbyl; R3, R6 = C1-5 aliphatic hydrocarbyl; R2, R5 = (un)substituted Ph, naphthyl, anthryl]. Thus, a molding comprising 100 parts Santac UT 61 (ABS resin) and 15 parts 2,4,8,10-tetraoxa-3,9-diphosphaspiro[5,5]undecane-3,9-di-α-methylbenzyl-3,9-dioxide showed UL-94 flammability rating V-2, heat distortion temperature retention 95%, and no burn marks.

IT **115-77-5**, Pentaerythritol, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(in manufacture of fireproofing agent; heat- and fire-resistant transparent ABS resin-based compns. containing tetraoxadiphosphaspiroundecanes)

RN 115-77-5 HCAPLUS

CN 1,3-Propanediol, 2,2-bis(hydroxymethyl)- (CA INDEX NAME)



IC ICM C08L055-02
ICS C08J005-00; C08K005-5357; C09K021-12; C08L101-00

CC 38-3 (Plastics Fabrication and Uses)
Section cross-reference(s): 29, 37

IT **Polyesters**, uses
RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(aromatic; heat- and fire-resistant transparent ABS resin-based compns. containing tetraoxadiphosphaspiroundecanes)

IT **Fluoropolymers**, uses
RL: MOA (Modifier or additive use); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(heat- and fire-resistant transparent ABS resin-based compns. containing tetraoxadiphosphaspiroundecanes)

IT **Polyesters**, uses
RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(heat- and fire-resistant transparent ABS resin-based compns. containing tetraoxadiphosphaspiroundecanes)

IT **Polyolefins**
RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(heat- and fire-resistant transparent ABS resin-based compns. containing tetraoxadiphosphaspiroundecanes)

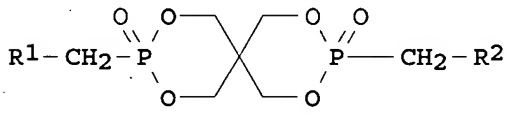
IT **115-77-5**, Pentaerythritol, reactions 585-71-7, 1-Phenylethyl bromide
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(in manufacture of fireproofing agent; heat- and fire-resistant

transparent ABS resin-based compns. containing tetraoxadiphosphaspiroundecanes)

L45 ANSWER 10 OF 14 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:52944 HCAPLUS
DOCUMENT NUMBER: 140:112461
TITLE: Halogen-free heat- and fire-resistant transparent ABS resin-based compositions containing organophosphorus compounds and their moldings
INVENTOR(S): Yamanaka, Katsuhiro; Taketani, Yutaka
PATENT ASSIGNEE(S): Teijin Chemicals Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 33 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004018731	A	20040122	JP 2002-177294 <--	200206 18
PRIORITY APPLN. INFO.:			JP 2002-177294 <--	200206 18

OTHER SOURCE(S): MARPAT 140:112461
GI

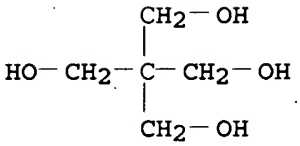


I

AB Title compns. contain 100 parts polymers containing ≥60% ABS and 1-100 parts organophosphorus compds. I [R1, R2 = (un)substituted Ph, naphthyl, anthryl] with acid value ≤0.7 mg KOH/g. Thus, a molding comprising 100 parts Santac UT 61 (ABS resin) and 15 parts 2,4,8,10-tetraoxa-3,9-diphosphaspiro[5,5]undecane-3,9-dibenzyl-3,9-dioxide showed UL-94 flammability rating V-2, heat distortion temperature retention 98%, and no burn marks.

IT **115-77-5**, Pentaerythritol, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(in manufacture of fireproofing agent; heat- and fire-resistant transparent ABS resin-based compns. containing tetraoxadiphosphaspiroundecanes)

RN 115-77-5 HCAPLUS
CN 1,3-Propanediol, 2,2-bis(hydroxymethyl)- (CA INDEX NAME)



IC ICM C08L055-02
ICS C08J005-00; C08K005-5357; C09K021-12; C08L101-00
CC 38-3 (Plastics Fabrication and Uses)
Section cross-reference(s): 29, 37
IT **Polyesters**, uses
RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(aromatic; heat- and fire-resistant transparent ABS resin-based compns. containing tetraoxadiphosphaspiroundecanes)
IT **Fluoropolymers**, uses
RL: MOA (Modifier or additive use); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(heat- and fire-resistant transparent ABS resin-based compns. containing tetraoxadiphosphaspiroundecanes)
IT **Polyesters**, uses
RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(heat- and fire-resistant transparent ABS resin-based compns. containing tetraoxadiphosphaspiroundecanes)
IT **Polyolefins**
RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(heat- and fire-resistant transparent ABS resin-based compns. containing tetraoxadiphosphaspiroundecanes)
IT 100-39-0, Benzyl bromide **115-77-5**, Pentaerythritol, reactions 7093-28-9, 3,9-Dibenzyloxy-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5,5]undecane
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(in manufacture of fireproofing agent; heat- and fire-resistant transparent ABS resin-based compns. containing tetraoxadiphosphaspiroundecanes)

L45 ANSWER 11 OF 14 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:52866 HCAPLUS
DOCUMENT NUMBER: 140:112203
TITLE: Aromatic **polyester** composition containing organic phosphate fireproofing agent and molding of the composition
INVENTOR(S): Yamanaka, Katsuhiro; Taketani, Yutaka
PATENT ASSIGNEE(S): Teijin Chemicals Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 42 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004018585	A	20040122	JP 2002-172650	200206

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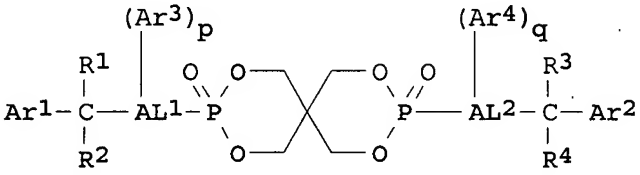
PRIORITY APPLN. INFO.: JP 2002-172650
200206
13
<--
OTHER SOURCE(S): MARPAT 140:112203
GI



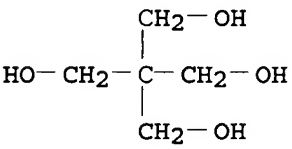
I

AB The composition contains 100 parts of a resin containing ≥60% of an aromatic **polyester**, 1-100 parts of the organic phosphate I (Ar1, Ar2 = Ph, naphthyl, anthryl; R1-R4 = H, C1-5 aliphatic hydrocarbyl, Ph, naphthyl, anthryl; AL1, AL2 = C1-5 branched or linear aliphatic hydrocarbyl; Ar3, Ar4 = Ph, naphthyl, anthryl; p, q = 0-3; each of Ar3 and Ar4 may be linked with AL1 and AL2; Ph, naphthyl, and anthryl may be substituted with aromatic ring) as the claimed fireproofing agent, 0-50 parts of a resin for improvement of fire resistance, and 0-200 parts of a filler. The composition is molded to give the halogen-free fire-resistant molding. Thus, 100 parts **poly(butylene** terephthalate) (TRB-H) and 15 parts 2,4,8,10-tetraoxa-3,9-diphophaspiro[5,5]undecane 3,9-di(2-phenylethyl)-3,9-dioxide were blended, mixed with chopped glass fiber, and injection-molded to give test pieces UL-94 flame retardance V-0 and limiting oxygen index (LOI) 27.5.

IT **115-77-5**, Pentaerythritol, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(aromatic **polyester** composition containing organic phosphate fireproofing agent from)

RN 115-77-5 HCAPLUS

CN 1,3-Propanediol, 2,2-bis(hydroxymethyl)- (CA INDEX NAME)



IC ICM C08L067-00
ICS C08J005-00; C08K005-5357

CC 37-6 (Plastics Manufacture and Processing)

ST org phosphate fireproofing agent arom **polyester**; halogen free arom **polyester** molding; **polybutylene** terephthalate org phosphate fireproofing agent

IT Glass fibers, uses
RL: MOA (Modifier or additive use); USES (Uses)
(ECS03T-187H; in aromatic **polyester** composition containing organic phosphate fireproofing agent for halogen-free molding)

IT **Fluoropolymers**, uses

RL: MOA (Modifier or additive use); USES (Uses)
(Polyflon MPA-FA 500; in aromatic **polyester** composition containing organic phosphate fireproofing agent for halogen-free molding)

IT **Polyesters**, uses
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(TR 8580H; aromatic **polyester** composition containing organic phosphate fireproofing agent for halogen-free molding)

IT Fire-resistant materials
Fireproofing agents
Transparent materials
(aromatic **polyester** composition containing organic phosphate fireproofing agent for halogen-free molding)

IT Polyamides, uses
Polyolefins
Polyoxyphenylenes
Polythiophenylenes
RL: MOA (Modifier or additive use); USES (Uses)
(aromatic **polyester** composition containing organic phosphate fireproofing agent for halogen-free molding)

IT **Polyesters**, uses
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(aromatic **polyester** composition containing organic phosphate fireproofing agent for halogen-free molding)

IT Polymer blends
RL: TEM (Technical or engineered material use); USES (Uses)
(aromatic **polyester** composition containing organic phosphate fireproofing agent for halogen-free molding)

IT Polycarbonates, uses
RL: MOA (Modifier or additive use); USES (Uses)
(aromatic; aromatic **polyester** composition containing organic phosphate fireproofing agent for halogen-free molding)

IT **Polyesters**, uses
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(aromatic; aromatic **polyester** composition containing organic phosphate fireproofing agent for halogen-free molding)

IT Epoxy resins, uses
Phenolic resins, uses
RL: MOA (Modifier or additive use); USES (Uses)
(for improving fire resistance; in aromatic **polyester** composition containing organic phosphate fireproofing agent for halogen-free molding)

IT **Fluoropolymers**, uses
RL: MOA (Modifier or additive use); USES (Uses)
(in aromatic **polyester** composition containing organic phosphate fireproofing agent for halogen-free molding)

IT Polyimides, uses
RL: MOA (Modifier or additive use); USES (Uses)
(polyether-; aromatic **polyester** composition containing organic phosphate fireproofing agent for halogen-free molding)

IT Polyethers, uses
RL: MOA (Modifier or additive use); USES (Uses)
(polyimide-; aromatic **polyester** composition containing organic phosphate fireproofing agent for halogen-free molding)

IT 9002-84-0, PTFE
RL: MOA (Modifier or additive use); USES (Uses)
(Polyflon MPA-FA 500; in aromatic **polyester** composition containing organic phosphate fireproofing agent for halogen-free molding)

IT 25038-59-9, TR 8550T, uses
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(TR 8580H; aromatic **polyester** composition containing organic phosphate fireproofing agent for halogen-free molding)
IT 24968-12-5, TRB-H
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(TRB-J; aromatic **polyester** composition containing organic phosphate fireproofing agent for halogen-free molding)
IT 62284-92-8P
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); PREP (Preparation); USES (Uses)
(aromatic **polyester** composition containing organic phosphate fireproofing agent for halogen-free molding)
IT 24936-68-3, Panlite L 1225WP, uses 24938-67-8, Xyron P 402 106677-58-1, Santac UT 61
RL: MOA (Modifier or additive use); USES (Uses)
(aromatic **polyester** composition containing organic phosphate fireproofing agent for halogen-free molding)
IT 9020-73-9, **Poly(ethylene** naphthalate)
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(aromatic **polyester** composition containing organic phosphate fireproofing agent for halogen-free molding)
IT 25038-54-4, NF 8020, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(aromatic **polyester** composition containing organic phosphate fireproofing agent for halogen-free molding)
IT 103-63-9, 2-Phenylethyl bromide **115-77-5**, Pentaerythritol, reactions 7719-12-2, Phosphorus trichloride
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(aromatic **polyester** composition containing organic phosphate fireproofing agent from)
IT 25037-45-0
RL: MOA (Modifier or additive use); USES (Uses)
(assumed monomers; aromatic **polyester** composition containing organic phosphate fireproofing agent for halogen-free molding)
IT 9020-32-0 26062-94-2
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(assumed monomers; aromatic **polyester** composition containing organic phosphate fireproofing agent for halogen-free molding)
IT 9003-53-6, Polystyrene 9003-54-7, Stylac AS 783 25068-38-6, Epikote 828 99752-88-2, PR 53195
RL: MOA (Modifier or additive use); USES (Uses)
(for improving fire resistance; in aromatic **polyester** composition containing organic phosphate fireproofing agent for halogen-free molding)
IT 347145-17-9, Blendex 449 878558-04-4, PFE 301S
RL: MOA (Modifier or additive use); USES (Uses)
(in aromatic **polyester** composition containing organic phosphate fireproofing agent for halogen-free molding)
IT 27198-72-7P
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(intermediate; aromatic **polyester** composition containing organic phosphate fireproofing agent from)

L45 ANSWER 12 OF 14 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2002:888823 HCAPLUS
DOCUMENT NUMBER: 137:370855
TITLE: Flame-retardant **polyester**-based resin compositions containing organic phosphorous compounds and molded articles therefrom
INVENTOR(S): Yamanaka, Katsuhiro; Taketani, Yutaka
PATENT ASSIGNEE(S): Teijin Chemicals, Ltd., Japan
SOURCE: PCT Int. Appl., 95 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002092690	A1	20021121	WO 2002-JP4659	200205 14
			<--	
W: CN, KR, US				
RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR				
JP 2003034749	A	20030207	JP 2002-138136	200205 14
			<--	
EP 1408085	A1	20040414	EP 2002-769597	200205 14
			<--	
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI, CY, TR				
CN 1509314	A	20040630	CN 2002-810103	200205 14
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JP 2003160722	A	20030606	JP 2002-165449	200206 06
			<--	
JP 2003213109	A	20030730	JP 2002-165450	200206 06
			<--	
US 2004127611	A1	20040701	US 2003-476390	200310 31
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US 7087667	B2	20060808		
US 2005256293	A1	20051117	US 2005-152372	200506 15
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PRIORITY APPLN. INFO.:			JP 2001-144478 A	200105 15
			<--	
			JP 2001-281268 A	

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	JP 2001-347212	A	
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			13
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	WO 2002-JP4659	W	
			200205
			14
		<--	
	US 2003-476390	A1	
			200310
			31
		<--	

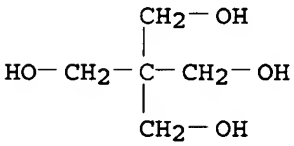
OTHER SOURCE(S): MARPAT 137:370855

AB Title compns. comprising (A) a resin component comprising ≥60 aromatic **polyester** resin 100, (B) a organophosphorus compound with acid value ≤0.7 mg-KOH/g, (C) a resin for improving flame retardancy 0-50, and (D) a filler 0-200 parts, are substantially halogen free, and meet UL94 V-2 or meet UL94 V-0 under suitable conditions. Thus, 6.81 parts pentaerythritol and 13.76 parts trichlorophosphine were reacted at 60° to give a 2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane,3,9-dihydro-3,9-dioxide, 10.94 parts benzyl bromide was added therein to give a 2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane,3,9-dibenzyl-3,9-dioxide with acid value 0.06 mg-KOH/g, 15 parts of which was mixed with 100 parts TRB-H to give a composition showing good flame retardancy.

IT **115-77-5**, Pentaerythritol, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(preparation of organic phosphorous flame retardants for halogen free flame-retardant **polyester** resin compns.)

RN 115-77-5 HCAPLUS

CN 1,3-Propanediol, 2,2-bis(hydroxymethyl)- (CA INDEX NAME)



IC ICM C08L067-02
ICS C08J005-00; C08K005-53

CC 37-6 (Plastics Manufacture and Processing)

ST flame retardant **polyester** compn TRB phosphorous compd molded article

IT Polyamides, properties
RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(NF 8020, blend with **polyester** and optionally or/and **perfluoropolymer**; preparation of organic phosphorous flame retardants for halogen free flame-retardant **polyester** resin compns.)

IT **Polyesters**, properties
RL: POF (Polymer in formulation); PRP (Properties); USES (Uses)
(aromatic, blend with thermoplastics, flame retardancy improving resins, and optionally **perfluoropolymers**; preparation of organic phosphorous flame retardants for halogen free

flame-retardant **polyester** resin compns.)

IT **Polyesters**, properties
RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(blend with flame retardancy improving resin, and optionally **perfluoropolymers**; preparation of organic phosphorous flame retardants for halogen free flame-retardant **polyester** resin compns.)

IT Polycarbonates, properties
RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(blend with **polyester** and optionally or/and **perfluoropolymer**; preparation of organic phosphorous flame retardants for halogen free flame-retardant **polyester** resin compns.)

IT Phenolic resins, properties
Polyoxyphenylenes
RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(blend with **polyester** and optionally **perfluoropolymers**; preparation of organic phosphorous flame retardants for halogen free flame-retardant **polyester** resin compns.)

IT **Fluoropolymers**, properties
RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(blend with **polyester** and optionally thermoplastic resins or/and flame retardancy improving resin; preparation of organic phosphorous flame retardants for halogen free flame-retardant **polyester** resin compns.)

IT Epoxy resins, properties
RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(blend with **polyester**, flame retardancy improving resin, and optionally **perfluoropolymers**; preparation of organic phosphorous flame retardants for halogen free flame-retardant **polyester** resin compns.)

IT **Polyolefins**
Polythiophenylenes
RL: POF (Polymer in formulation); PRP (Properties); USES (Uses)
(blend with **polyester**, flame retardancy improving resins, and optionally **perfluoropolymers**; preparation of organic phosphorous flame retardants for halogen free flame-retardant **polyester** resin compns.)

IT Glass fibers, uses
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(filler; preparation of organic phosphorous flame retardants for halogen free flame-retardant **polyester** resin compns.)

IT Phosphates, preparation
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); PREP (Preparation); USES (Uses)
(organic, flame retardants; preparation of organic phosphorous flame retardants for halogen free flame-retardant **polyester** resin compns.)

IT Polymer blends
RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(**polyester** and thermoplastic resins, or/and flame retardancy improving resin, and **perfluoropolymers**;

preparation of organic phosphorous flame retardants for halogen free flame-retardant **polyester** resin compns.)

IT Polyimides, properties
RL: POF (Polymer in formulation); PRP (Properties); USES (Uses)
(polyether-, blend with **polyester**, flame retardancy improving resins, and optionally **perfluoropolymers**; preparation of organic phosphorous flame retardants for halogen free flame-retardant **polyester** resin compns.)

IT Polyethers, properties
RL: POF (Polymer in formulation); PRP (Properties); USES (Uses)
(polyimide-, blend with **polyester**, flame retardancy improving resins, and optionally **perfluoropolymers**; preparation of organic phosphorous flame retardants for halogen free flame-retardant **polyester** resin compns.)

IT Fillers
Fire-resistant materials
Fireproofing agents
(preparation of organic phosphorous flame retardants for halogen free flame-retardant **polyester** resin compns.)

IT **Fluoropolymers**, properties
Polyamides, properties
Polyesters, properties
RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(preparation of organic phosphorous flame retardants for halogen free flame-retardant **polyester** resin compns.)

IT Molded plastics, properties
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(preparation of organic phosphorous flame retardants for halogen free flame-retardant **polyester** resin compns.)

IT 25038-54-4, Nylon 6, properties
RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(NF 8020, blend with **polyester** and optionally or/and **perfluoropolymer**; preparation of organic phosphorous flame retardants for halogen free flame-retardant **polyester** resin compns.)

IT 25038-59-9, TR 8580H, properties
RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(blend with flame retardancy improving resin, and optionally **perfluoropolymers**; preparation of organic phosphorous flame retardants for halogen free flame-retardant **polyester** resin compns.)

IT 9003-53-6, Styron GPPS 9003-54-7, Stylac AS 783 24936-68-3, Panlite L 1225WP, properties 24938-67-8, P 402 25037-45-0 25068-38-6 99752-88-2, PR 53195 106677-58-1, Santac UT 61
RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(blend with **polyester** and optionally or/and **perfluoropolymer**; preparation of organic phosphorous flame retardants for halogen free flame-retardant **polyester** resin compns.)

IT 9002-84-0, Polyflon MPAFA 500 347145-17-9, Blendex 449
RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(blend with **polyester** and optionally thermoplastic resins or/and flame retardancy improving resin; preparation of organic phosphorous flame retardants for halogen free flame-retardant

polyester resin compns.)

IT 9020-32-0 9020-73-9, **Poly(ethylene** naphthalate) 9052-39-5, Cyclohexanedimethanol-terephthalic acid copolymer 9053-81-0, Cyclohexanedimethanol-terephthalic acid copolymer, sru 26546-03-2 26590-75-0, Poly(trimethylene terephthalate) 51806-50-9, **Poly(butylene** naphthalate) 52309-38-3 262266-43-3 262371-02-8
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(blend with thermoplastic resin, flame retardancy improving resin, filler, and optionally **perfluoropolymer**; preparation of organic phosphorous flame retardants for halogen free flame-retardant **polyester** resin compns.)

IT 20544-37-0P 62284-92-8P 475101-74-7P 475101-76-9P
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); PREP (Preparation); USES (Uses)
(flame retardant; preparation of organic phosphorous flame retardants for halogen free flame-retardant **polyester** resin compns.)

IT 1889-67-4, Nofmer BC 35948-25-5, HCA
RL: MOA (Modifier or additive use); USES (Uses)
(flame retardant; preparation of organic phosphorous flame retardants for halogen free flame-retardant **polyester** resin compns.)

IT 27198-72-7P
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(intermediate; preparation of organic phosphorous flame retardants for halogen free flame-retardant **polyester** resin compns.)

IT 24968-12-5, TRB-H 26062-94-2, Butanediol-terephthalic acid copolymer
RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(optionally blend with thermoplastic resin, flame retardancy improving resin, or/and **perfluoropolymers**; preparation of organic phosphorous flame retardants for halogen free flame-retardant **polyester** resin compns.)

IT 878558-04-4, PFE 301S
RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(preparation of organic phosphorous flame retardants for halogen free flame-retardant **polyester** resin compns.)

IT 100-39-0, Benzyl bromide 100-51-6, Benzylalcohol, reactions 103-63-9, 2-Bromoethylbenzene **115-77-5**, Pentaerythritol, reactions 585-71-7, 1-Bromoethylbenzene 776-74-9, Diphenylmethyl bromide 7093-28-9, 3,9-Dibenzyloxy-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane 7719-12-2, Trichlorophosphine 54767-39-4 475101-75-8, 3,9-Di(2-phenylethoxy)-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane 475101-77-0, 3,9-Bis(diphenylmethoxy)-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(preparation of organic phosphorous flame retardants for halogen free flame-retardant **polyester** resin compns.)

REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L45 ANSWER 13 OF 14 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2002:367188 HCAPLUS
DOCUMENT NUMBER: 136:371121
TITLE: Cured coatings having improved scratch

resistance, coated substrates, and coating/curing process

INVENTOR(S): Anderson, Lawrence G.; Barkac, Karen A.; Chasser, Anthony M.; Desaw, Shawn A.; Hartman, Marvis E.; Hayes, Deborah E.; Hockswender, Thomas R.; Kuster, Kymarie L.; Montague, Robert A.; Nakajima, Masayuki; Olson, Kurt G.; Richardson, Jamel S.; Sadvary, Richard J.; Simpson, Dennis A.; Tyebjee, Shiryn; Wilt, Truman F.

PATENT ASSIGNEE(S): PPG Industries Ohio, Inc., USA

SOURCE: U.S., 67 pp., Cont.-in-part of U.S. Ser. No. 489,043, abandoned.
CODEN: USXXAM

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 9

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6387519	B1	20020514	US 2000-629423	200007 31
			<--	
ES 2249285	T3	20060401	ES 2000-950897	200007 31
			<--	
US 2002086168	A1	20020704	US 2001-919198	200107 31
			<--	
US 6623791	B2	20030923		
JP 2006057098	A	20060302	JP 2005-241909	200508 23
			<--	
JP 2006070278	A	20060316	JP 2005-339500	200511 24
			<--	
JP 2006213925	A	20060817	JP 2006-66801	200603 10
			<--	

PRIORITY APPLN. INFO.:

US 1999-365069	B2	199907 30
<--		
US 1999-171899P	P	199912 23
<--		
US 2000-489043	B2	200001 21
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US 1999-171898P	P	

		199912
		23
	<--	
US 2000-489042	A	
		200001
		21
	<--	
US 2000-489132	B2	
		200001
		21
	<--	
JP 2001-514054	A3	
		200007
		31
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JP 2001-514056	A3	
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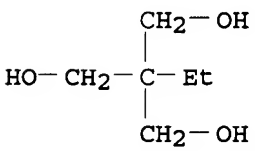
		31
	<--	
JP 2001-521985	A3	
		200007
		31
	<--	
US 2000-629423	A2	
		200007
		31
	<--	
US 2000-629443	A2	
		200007
		31
	<--	

AB Cured coatings have particles at a surface region of the cured coating. Multi-component composite coatings include a cured basecoat deposited from a pigmented coating composition and a cured topcoat. The multi-component composite coatings provide highly scratch resistant color-plus-clear coatings capable of retaining scratch resistance after weathering. The coatings are cured by ionizing radiation, actinic radiation, or ionizing or actinic radiation and thermal methods.

IT **77-99-6**, Trimethylolpropane
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(binder precursor; cured coatings having inorg. filler particles in greater concns. near surfaces for improved scratch resistance)

RN 77-99-6 HCAPLUS

CN 1,3-Propanediol, 2-ethyl-2-(hydroxymethyl)- (CA INDEX NAME)



IC ICM B32B005-16
ICS B32B009-04; C08K003-34; C08K003-36; C08K083-04

INCL 428447000

CC 42-5 (Coatings, Inks, and Related Products)

IT **Polyesters**, uses
RL: PRP (Properties); TEM (Technical or engineered material use);

USES (Uses)
(acrylic, coating binder; cured coatings having inorg. filler particles in greater concns. near surfaces for improved scratch resistance)

IT **Polyolefin** rubber
RL: MSC (Miscellaneous)
(substrates; cured coatings having inorg. filler particles in greater concns. near surfaces for improved scratch resistance)

IT **Fluoropolymers**, uses
Polysiloxanes, uses
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(surfactants; cured coatings having inorg. filler particles in greater concns. near surfaces for improved scratch resistance)

IT 75-56-9, Propylene oxide, reactions **77-99-6**, Trimethylolpropane 999-97-3, Hexamethyldisilazane 25550-51-0, Methylhexahydrophthalic anhydride
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(binder precursor; cured coatings having inorg. filler particles in greater concns. near surfaces for improved scratch resistance)

REFERENCE COUNT: 320 THERE ARE 320 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L45 ANSWER 14 OF 14 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1999:603562 HCAPLUS
DOCUMENT NUMBER: 131:229601
TITLE: Fire- and heat-resistant polycarbonate-**polyester** blend compositions containing cyclic phosphates and inorganic salts
INVENTOR(S): Sato, Takahiro; Taketani, Yutaka
PATENT ASSIGNEE(S): Teijin Chemicals Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 9 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 11256021	A	19990921	JP 1998-56773	199803 09 <--
JP 3899177	B2	20070328		

PRIORITY APPLN. INFO.: JP 1998-56773 199803 09 <--

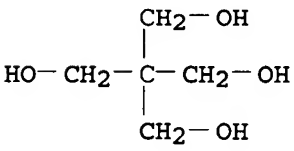
AB Title compns. comprise (A) polycarbonates 96-40, (B) **polyesters** 1-55, (C) cyclic phosphates 2-20, (D) inorg. salts selected from carbonates and phosphates of alkaline earth metals ≤10, and (E) **fluoropolymers** 0.01-3 parts, where A + B + C + D + E = 100 parts and mol ratios of P atoms (from component C) to D ≥0.02. Thus, a composition comprising Panlite L 1225WP 55.7, TR 8580 30, di-Ph pentaerythritol diphosphate (preparation given) 12, Polyflon FA 500 0.3, and calcium carbonate 2 parts gave flammability (UL 94) V-0 and deflection temperature (JIS K 7207, 18.5

kg/cm2-load) 104°.

IT **115-77-5**, Pentaerythritol, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(in preparation of cyclic phosphates for fire- and heat-resistant polycarbonate-**polyester** blend compns.)

RN 115-77-5 HCAPLUS

CN 1,3-Propanediol, 2,2-bis(hydroxymethyl)- (CA INDEX NAME)



IC ICM C08L069-00
ICS C08K013-02; C08L069-00; C08L067-02; C08L027-12; C08K005-523; C08K003-26; C08K003-32

CC 37-6 (Plastics Manufacture and Processing)

ST fire heat resistant polycarbonate **polyester** blend; cyclic phosphate fireproofing agent polycarbonate **polyester**; carbonate alk earth metal fireproofing compn; **fluoropolymer** Polyflon fireproofing compn; phenyl pentaerythritol phosphate fireproofing Panlite compn; calcium carbonate fireproofing compn

IT **Polyesters**, uses
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(blends with polycarbonates; fire- and heat-resistant polycarbonate-**polyester** blend compns.)

IT Polycarbonates, uses
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(blends with **polyesters**; fire- and heat-resistant polycarbonate-**polyester** blend compns.)

IT Alkaline earth salts
RL: MOA (Modifier or additive use); USES (Uses)
(carbonates or phosphates; fire- and heat-resistant polycarbonate-**polyester** blend compns.)

IT Fireproofing agents
Heat-resistant materials
(fire- and heat-resistant polycarbonate-**polyester** blend compns.)

IT **Fluoropolymers**, uses
RL: MOA (Modifier or additive use); USES (Uses)
(fire- and heat-resistant polycarbonate-**polyester** blend compns.)

IT Polymer blends
RL: TEM (Technical or engineered material use); USES (Uses)
(polycarbonate-**polyester**; fire- and heat-resistant polycarbonate-**polyester** blend compns.)

IT 3812-32-6, Carbonate, uses
RL: MOA (Modifier or additive use); USES (Uses)
(alkaline earth metal salts; fire- and heat-resistant polycarbonate-**polyester** blend compns.)

IT 9020-32-0, **Polyethylene** naphthalate 9020-73-9
24968-12-5, TRB-J 25038-59-9, TR 8580, uses 26062-94-2
51806-50-9, 1,4-Butanediol-naphthalenedicarboxylic acid copolymer, sru 52309-38-3
RL: POF (Polymer in formulation); TEM (Technical or engineered

material use); USES (Uses)
(blends with polycarbonates; fire- and heat-resistant polycarbonate-**polyester** blend compns.)

IT 24936-68-3, Panlite L 1225WP, uses 25037-45-0, Bisphenol A-carbonic acid copolymer
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(blends with **polyesters**; fire- and heat-resistant polycarbonate-**polyester** blend compns.)

IT 14265-44-2, Phosphate, uses
RL: MOA (Modifier or additive use); USES (Uses)
(cyclic esters or alkaline earth metal salts; fire- and heat-resistant polycarbonate-**polyester** blend compns.)

IT 471-34-1, Calcium carbonate, uses 513-77-9, Barium carbonate 546-93-0, Magnesium carbonate 7758-87-4, Calcium phosphate 9002-84-0, Polyflon FA 500
RL: MOA (Modifier or additive use); USES (Uses)
(fire- and heat-resistant polycarbonate-**polyester** blend compns.)

IT 55120-33-7P, Diphenyl pentaerythritol diphosphate 97994-13-3P 239802-94-9P
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); PREP (Preparation); USES (Uses)
(fireproofing agents; fire- and heat-resistant polycarbonate-**polyester** blend compns.)

IT 770-12-7P, Phenyl dichlorophosphate 18350-98-6P
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(in preparation of cyclic phosphates for fire- and heat-resistant polycarbonate-**polyester** blend compns.)

IT 98-54-4, 4-tert-Butylphenol 108-95-2, Phenol, reactions **115-77-5**, Pentaerythritol, reactions 576-26-1, 2,6-Dimethylphenol 10025-87-3, Phosphorus oxychloride
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(in preparation of cyclic phosphates for fire- and heat-resistant polycarbonate-**polyester** blend compns.)

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L48 ANSWER 1 OF 4 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2003:945729 HCAPLUS
DOCUMENT NUMBER: 139:398183
TITLE: Grease-filled heat-resistant rolling bearing
INVENTOR(S): Maeda, Kikuo; Aso, Mitsunari; Hirata, Masakazu
PATENT ASSIGNEE(S): NTN Corp., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 8 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2003343576	A	20031203	JP 2002-155863	200205

29
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PRIORITY APPLN. INFO.: JP 2002-155863
200205
29
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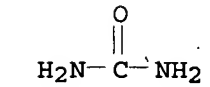
AB A rolling bearing is filled with grease containing a perfluoropolyether oil and synthetic oil and also a powdered fluororesin and urea **compound** as a **thickening agent.** The inner and outer ring in the bearing are from a steel tempered at ≥250° and having a hardness HRC ≥59. The steel contains C 0.6-1.3, Si 0.3-3.0, Ni 0.1-3.0, Mn 0.2-1.5, and Cr 0.3-5.0%. The bearing demonstrates no seizure or lubrication defects even in continuous operation at a high temperature and under a high load.

IT **57-13-6D**, Urea, **compds.**
RL: DEV (Device component use); **USES (Uses)**
(thickening agent; grease-filled heat-resistant rolling bearing)

RN 57-13-6 HCAPLUS
CN Urea (CA INDEX NAME)



IC ICM F16C033-58
ICS F16C033-32; F16C033-66
CC 55-6 (Ferrous Metals and Alloys)
Section cross-reference(s): 51
ST rolling bearing perfluoropolyether **lubricating grease**
IT **Thickening agents**
(grease-filled heat-resistant rolling bearing)
IT **Fluoropolymers**, uses
RL: DEV (Device component use); USES (Uses)
(thickening agent; grease-filled heat-resistant rolling bearing)
IT **57-13-6D**, Urea, **compds.**
RL: DEV (Device component use); **USES (Uses)**
(thickening agent; grease-filled heat-resistant rolling bearing)

L48 ANSWER 2 OF 4 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2001:235738 HCAPLUS
DOCUMENT NUMBER: 134:268624
TITLE: **Lubricating grease** composition for automobile parts or household appliances
INVENTOR(S): Endo, Toshiaki; Yamazaki, Satoshi; Kuwahara, Hirofumi; Kawamura, Satoshi; Ishizaki, Tomonori; Yamamoto, Yasuharu; Kato, Hiroaki
PATENT ASSIGNEE(S): Kyodo Yushi K. K., Japan; Toyoda Machine Works, Ltd.
SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2001089778	A	20010403	JP 1999-269773	199909 24

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PRIORITY APPLN. INFO.: JP 1999-269773 199909 24

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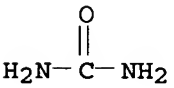
AB The title composition is prepared by blending a base oil with 0.5-20 weight of PTFE powder (average grain size ≤0.2 μm) as solid lubricant, and a thickener such as urea compds. or Li soap. The base oil is preferably poly(α-olefin), paraffinic mineral oil, and/or alkyl di-Ph ethers.

IT **57-13-6D**, Urea, **compds.**, uses
RL: **MOA (Modifier or additive use); USES (Uses)**
(thickener; lubricating grease composition for automobile parts or household appliances)

RN 57-13-6 HCAPLUS
CN Urea (CA INDEX NAME)



IC ICM C10M107-38
ICS C10M115-08; C10M119-24; C10N020-06; C10N030-06; C10N040-04; C10N050-10

CC 51-8 (Fossil Fuels, Derivatives, and Related Products)

ST **lubricating grease** PTFE powder automobile part appliance

IT Antifriction materials
(antifriction-antiwear **lubricating grease additives**, PFTE powder; for **automobile** parts or household appliances)

IT **Lubricating grease** additives
(antifriction-antiwear, PFTE powder; for automobile parts or household appliances)

IT Appliances
(**lubricating grease** composition for automobile parts or household appliances)

IT **Fluoropolymers**, uses
RL: MOA (Modifier or additive use); USES (Uses)
(powder. solid **lubricant** as; **lubricating grease** composition for automobile parts or household appliances)

IT **Lubricating grease** additives
(urea compds.-based; for automobile parts or household appliances)

IT 1317-33-5, Molybdenum disulfide, uses 9002-84-0, KTL 610
RL: MOA (Modifier or additive use); USES (Uses)
(powder. solid **lubricant** as; **lubricating grease** composition for automobile parts or household

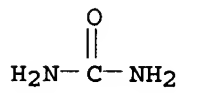
appliances)
IT **57-13-6D**, Urea, **compds.**, uses 37640-57-6, Melamine cyanurate
RL: **MOA (Modifier or additive use)**; **USES (Uses)**
(thickener; lubricating grease
composition for automobile parts or household appliances)

L48 ANSWER 3 OF 4 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1998:335644 HCAPLUS
DOCUMENT NUMBER: 129:69812
TITLE: Semi-solid tris(2-octyldodecyl)cyclopentane lubricant composition
INVENTOR(S): Moriuchi, Tsutomu; Kimura, Hiroshi
PATENT ASSIGNEE(S): Kyodo, Yushi, Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 4 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 10140169	A	19980526	JP 1996-294939	19961107

PRIORITY APPLN. INFO.: JP 1996-294939 19961107

AB The lubricant composition contains tris(2-octyldodecyl)cyclopentane and a thickener or a solid lubricant additive. The lubricant composition has high compatibility with other **lubricating greases**, low vapor pressure, and good lubricity under high temperature and high vacuum. The lubricant composition is suitable for use in space stations, equipment for semiconductor fabrication, etc.
IT **57-13-6D**, Urea, **compds.**, uses
RL: **MOA (Modifier or additive use)**; TEM (Technical or engineered material use); **USES (Uses)**
(thickener; semi-solid lubricant composition containing tris(2-octyldodecyl)cyclopentane and thickener or solid lubricant additive)
RN 57-13-6 HCAPLUS
CN Urea (CA INDEX NAME)



IC ICM C10M105-04
ICS C10M169-02; C10M169-04; C10M105-04; C10M117-02; C10M115-08; C10M113-10; C10M113-12; C10M125-22; C10M139-00; C10M125-02; C10M147-02; C10M125-20; C10N010-12; C10N030-00; C10N030-08; C10N040-06; C10N050-10
CC 51-8 (Fossil Fuels, Derivatives, and Related Products)
ST octyldodecyl cyclopentane **lubricating grease**

compatibility; thickener octyldodecyl cyclopentane **lubricating grease**; lubricant solid additive octyldodecyl cyclopentane grease; semiconductor fabrication lubricant octyldodecyl cyclopentane; space station lubricant octyldodecyl cyclopentane

IT **Lubricating grease** additives
Lubricating greases
(semi-solid **lubricant** composition containing tris(2-octyldodecyl)cyclopentane and thickener or solid lubricant additive)

IT **Fluoropolymers**, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(solid lubricant; semi-solid lubricant composition containing tris(2-octyldodecyl)cyclopentane and thickener or solid lubricant additive)

IT 51-79-6D, Urethane, **compds. 57-13-6D**, Urea, **compds.**, uses 4485-12-5, Lithium stearate 7620-77-1, Lithium 12-hydroxystearate 7631-86-9D, Silica, **compds.**, uses
RL: **MOA (Modifier or additive use)**; TEM (Technical or engineered material use); **USES (Uses)**
(**thickener**; semi-solid lubricant composition containing tris(2-octyldodecyl)cyclopentane and thickener or solid lubricant additive)

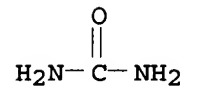
L48 ANSWER 4 OF 4 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1977:520187 HCAPLUS
DOCUMENT NUMBER: 87:120187
TITLE: Relationship between the chemical structure of a lubricant and fretting
AUTHOR(S): Wunsch, F.
CORPORATE SOURCE: Kluber Lubrication Munchen KG, Munich, Fed. Rep. Ger.
SOURCE: Tribology International (**1977**), 10(3), 147-51
CODEN: TRBIBK; ISSN: 0301-679X
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Greases and their base oils were applied between a steel ring oscillating around an axle and a supported spring steel band and tested for wear and fretting corrosion at load 1.5 N/mm, amplitude 0.5mm, and frequency 50 Hz. The wear and fretting corrosion did not decrease with increasing viscosity. Rigid mols. with high mesomerism such as polyphenylsiloxanes, polyphenyl ethers, and fluorinated polyethers increased fretting corrosion. A relation between fretting corrosion and stick-slip behavior was established; the thermal and oxidative stability of the lubricants were not responsible for the fretting corrosion of lubricated surfaces. When oils were thickened to **lubricating greases**, their ability to prevent wear and fretting corrosion depended on the thickeners. The performance of polar basic oils and polyphenyl ethers was improved by condensed-urea thickeners. Alkali metal soaps and alkaline earth metal soaps deteriorated the performance of basic oils, and bentonite increased wear, but not fretting corrosion.

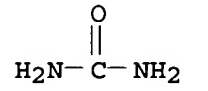
IT **57-13-6**, uses and miscellaneous
RL: **USES (Uses)**
(**lubricating grease** thickeners, wear and fretting corrosion in presence of)

RN 57-13-6 HCAPLUS

CN Urea (CA INDEX NAME)



IT **57-13-6D**, condensation polymers
RL: **USES (Uses)**
(**lubricating-grease** thickeners, wear and fretting corrosion in presence of)
RN 57-13-6 HCAPLUS
CN Urea (CA INDEX NAME)



CC 51-7 (Fossil Fuels, Derivatives, and Related Products)
ST lubricating oil fretting corrosion; **grease lubricating** fretting corrosion
IT Wear
(by fretting corrosion, structure of **lubricating** oils and **greases** in relation to)
IT **Lubricating greases**
(composition of, fretting corrosion in relation to)
IT Molecular structure-property relationship
(fretting corrosion, of **lubricating** oils and **greases**)
IT Bentonite, uses and miscellaneous
RL: USES (Uses)
(**lubricating grease** thickeners, wear and fretting corrosion in presence of)
IT Corrosion
(fretting, chemical structure of **lubricating** oils and **greases** in relation to)
IT **Fluoropolymers**
(polyether, lubricating oils, fretting corrosion in relation to structure of)
IT **Lubricating grease additives**
(**thickeners**, composition of, fretting corrosion in relation to)
IT **57-13-6**, uses and miscellaneous 7429-90-5D, soaps 7439-93-2D, soaps 7440-39-3D, soaps
RL: **USES (Uses)**
(**lubricating grease** thickeners, wear and fretting corrosion in presence of)
IT **57-13-6D**, condensation polymers
RL: **USES (Uses)**
(**lubricating-grease** thickeners, wear and fretting corrosion in presence of)

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L50 ANSWER 1 OF 9 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1999:464261 HCAPLUS

DOCUMENT NUMBER: 131:90037
TITLE: Biodegradable high hydroxyl synthetic ester base stocks and lubricants formed therefrom
INVENTOR(S): Henry, Thomas H.; Schlosberg, Richard H.; Duncan, Carolyn B.
PATENT ASSIGNEE(S): Exxon Chemical Patents Inc., USA
SOURCE: PCT Int. Appl., 29 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9936387	A1	19990722	WO 1999-US581	19990111
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W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
RW: GH, GM, KE, LS, MW, SD, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
AU 9923157	A	19990802	AU 1999-23157	19990111
			<--	

PRIORITY APPLN. INFO.: US 1998-71013P P 19980113
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WO 1999-US581 W 19990111
<--

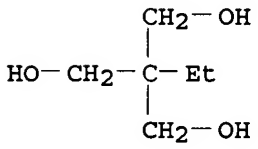
OTHER SOURCE(S): MARPAT 131:90037

AB This invention relates to a biodegradable lubricant which is prepared from: at least one biodegradable synthetic ester base stock with a branched or linear alc. having the general formula R(OH)n, wherein R is an aliphatic or cycloaliph. group having 2-20 carbon atoms and n is at least 2; and at least one branched or linear monocarboxylic acid which has a carbon number in the range C5 to C20; wherein the synthetic ester composition has 2-50% unconverted hydroxyl groups, based on the total amount of hydroxyl groups in the branched or linear alc.; wherein the ester base stock exhibits the following properties: at least 25% biodegrdn. in 28 days as measured by the Modified Sturm test; and a pour point of less than -25°; and an additive package.

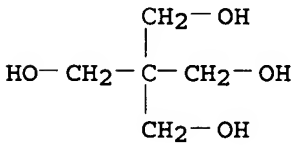
IT **77-99-6 115-77-5**, reactions **115-77-5D**, Pentaerythritol, tech. **126-58-9**
RL: **RCT (Reactant); RACT (Reactant or reagent)**
(in preparation of biodegradable high hydroxyl synthetic ester base stocks and **lubricants** formed therefrom)

RN 77-99-6 HCAPLUS

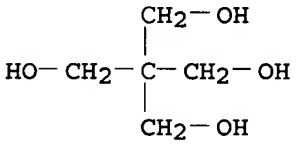
CN 1,3-Propanediol, 2-ethyl-2-(hydroxymethyl)- (CA INDEX NAME)



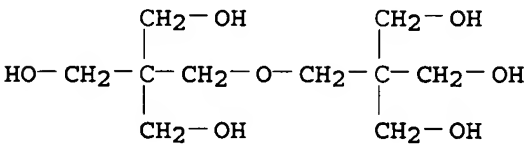
RN 115-77-5 HCAPLUS
CN 1,3-Propanediol, 2,2-bis(hydroxymethyl)- (CA INDEX NAME)



RN 115-77-5 HCAPLUS
CN 1,3-Propanediol, 2,2-bis(hydroxymethyl)- (CA INDEX NAME)



RN 126-58-9 HCAPLUS
CN 1,3-Propanediol, 2,2'-[oxybis(methylene)]bis[2-(hydroxymethyl)-
(9CI) (CA INDEX NAME)



IC ICM C07C069-28
ICS C07C069-30; C07C069-33; C10M105-38
CC 51-8 (Fossil Fuels, Derivatives, and Related Products)
IT Biodegradable materials
Drilling fluids
Hydraulic fluids
Lubricants
Lubricating greases
Lubricating oils
(biodegradable high hydroxyl synthetic ester base stocks and lubricants formed therefrom)
IT 50-70-4, Sorbitol, reactions 56-81-5, 1,2,3-Propanetriol, reactions 57-55-6, 1,2-Propanediol, reactions 64-19-7, Acetic acid, reactions 75-98-9, 2,2-Dimethylpropionic acid 77-84-9 77-85-0, Trimethylolethane **77-99-6** 78-24-0, Tripentaerythritol 79-09-4, Propionic acid, reactions 107-21-1,

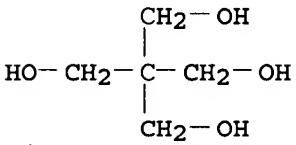
1,2-Ethanediol, reactions 109-52-4, Pentanoic acid, reactions
110-63-4, 1,4-Butanediol, reactions 111-14-8, Heptanoic acid
112-05-0, Nonanoic acid 112-80-1, 9-Octadecenoic acid (9Z)-,
reactions **115-77-5**, reactions **115-77-5D**,
Pentaerythritol, tech. 124-07-2, Octanoic acid, reactions
126-30-7 **126-58-9** 149-57-5, 2-Ethylhexanoic acid
334-48-5, Decanoic acid 1330-19-4, Isoheptanoic acid 2163-42-0
3302-10-1, 3,5,5-Trimethylhexanoic acid 7426-71-3,
Trimethylolbutane 25103-52-0, Isooctanoic acid 26403-17-8,
Isodecanoic acid 26896-18-4, Isononanoic acid 26896-20-8,
Neodecanoic acid 33113-10-9, Neoheptanoic acid 59354-78-8,
Neononanoic acid 101962-32-7, Neooctanoic acid
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(in preparation of biodegradable high hydroxyl synthetic ester base stocks and **lubricants** formed therefrom)

REFERENCE COUNT: 1 THERE ARE 1 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L50 ANSWER 2 OF 9 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1999:260031 HCAPLUS
DOCUMENT NUMBER: 130:269548
TITLE: Thio-/mercapto-derivatives and use as antioxidant additives for lubricants and fuels
INVENTOR(S): Francisco, Manuel A.; Puckace, James S.; Cameron, Stephen D.; Polizzotti, Richard Samuel
PATENT ASSIGNEE(S): Exxon Research and Engineering Company, USA
SOURCE: Eur. Pat. Appl., 27 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 909755	A1	19990421	EP 1998-117609	199809 17
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO			<--	
CA 2243265	A1	19990326	CA 1998-2243265	199809 01
			<--	
MX 9807764	A	20000630	MX 1998-7764	199809 23
			<--	
BR 9803504	A	19991207	BR 1998-3504	199809 24
			<--	
AU 9887079	A	19990415	AU 1998-87079	199809 25
			<--	
JP 11158482	A	19990615	JP 1998-273833	

199809
28
<--
PRIORITY APPLN. INFO.: US 1997-938650 A
199709
26
<--
OTHER SOURCE(S): MARPAT 130:269548
AB Defined oil-soluble said derivs., more especially certain derivs. of pentaerythritol, are described. They have active C-S bonds (those containing sulfur bonded to carbon having a tertiary hydrogen and an electron withdrawing group). Said derivs. may be used to enhance the oxidation-resistance of lubricating oils, fuels and greases.
IT **115-77-5D**, Pentaerythritol, derivs.
RL: MOA (Modifier or additive use); **RCT (Reactant)**; **RACT (Reactant or reagent)**; USES (Uses)
(thio-/mercapto-derivs. and their use as **antioxidant** additives for **lubricants** and fuels)
RN 115-77-5 HCAPLUS
CN 1,3-Propanediol, 2,2-bis(hydroxymethyl)- (CA INDEX NAME)



IC ICM C07C323-52
ICS C10M135-26
CC 51-8 (Fossil Fuels, Derivatives, and Related Products)
IT Fuel additives
Lubricating greases
(thio-/mercapto-derivs. and their use as antioxidant additives for lubricants and fuels)
IT **115-77-5D**, Pentaerythritol, derivs.
RL: MOA (Modifier or additive use); **RCT (Reactant)**; **RACT (Reactant or reagent)**; USES (Uses)
(thio-/mercapto-derivs. and their use as **antioxidant** additives for **lubricants** and fuels)
REFERENCE COUNT: 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L50 ANSWER 3 OF 9 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1999:233975 HCAPLUS
DOCUMENT NUMBER: 130:239798
TITLE: Complex esters, formulations comprising these esters and use thereof
INVENTOR(S): Kenbeek, Dirk; Verboom, Cornelis; Van Der Waal, Gijsbert
PATENT ASSIGNEE(S): Unichema Chemie B.V., Neth.
SOURCE: PCT Int. Appl., 21 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

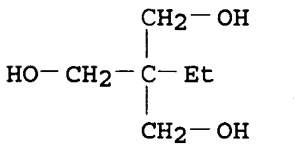
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9916849	A1	19990408	WO 1998-EP6145	199809 28
			<--	
W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
RW: GH, GM, KE, LS, MW, SD, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
CA 2304509	A1	19990408	CA 1998-2304509	199809 28
			<--	
AU 9911475	A	19990423	AU 1999-11475	199809 28
			<--	
EP 1019465	A1	20000719	EP 1998-954289	199809 28
			<--	
EP 1019465	B1	20030730		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI				
JP 2003522204	T	20030722	JP 2000-513925	199809 28
			<--	
AT 246239	T	20030815	AT 1998-954289	199809 28
			<--	
US 6462001	B1	20021008	US 2000-541166	200003 31
			<--	
PRIORITY APPLN. INFO.:			EP 1997-202992 A	199710 01
			<--	
			WO 1998-EP6145 W	199809 28
			<--	

AB An ester resulting from an esterification reaction between at least one polyfunctional alc. and at least one polyfunctional carboxylic acid using a chain stopping agent to form ester bonds with the remaining hydroxyl or carboxyl groups is disclosed. The polyfunctional carboxylic acid comprises an aliphatic dicarboxylic acid containing from 9 to 18 carbon atoms, dimerized and/or trimerized fatty acids or mixts. thereof, with the proviso that dimerized and trimerized fatty acids do not constitute >80% by weight of the total amount of polyfunctional carboxylic acid used. The chain stopping

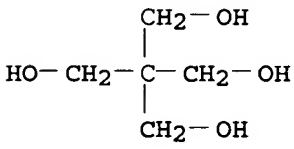
agent may be a monocarboxylic acid or a monofunctional alc. having at least 14 carbon atoms. The complex esters have a kinematic viscosity at 100 C of from 30 to 1000 cSt, preferably from 30 to 200 cSt. The complex ester is useful "as is" or as an additive and/or as a base fluid and/or a thickener in transmission oils, hydraulic fluids, four-stroke oils, fuel additives, compressor oils, greases, chain oils and for metal working metal rolling applications. A multigrade gear oil formulation comprising one or more of the above complex esters is also part of the invention.

IT **77-99-6**, Trimethylolpropane **115-77-5**, Pentaerythritol, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(complex esters, **lubricant** formulations comprising these esters and use thereof)

RN 77-99-6 HCAPLUS
CN 1,3-Propanediol, 2-ethyl-2-(hydroxymethyl)- (CA INDEX NAME)



RN 115-77-5 HCAPLUS
CN 1,3-Propanediol, 2,2-bis(hydroxymethyl)- (CA INDEX NAME)



IC ICM C10M105-42
ICS C10M105-44; C10M105-46; C10M129-78; C10M129-80; C10M129-82; C10M169-04; C10M171-00; C10L001-18; C07C069-34; C07C069-50; C07C069-593; C07C069-604

CC 51-8 (Fossil Fuels, Derivatives, and Related Products)

IT Fuel additives
Hydraulic fluids
Lubricating greases
Lubricating oils
(complex esters, **lubricant** formulations comprising these esters and use thereof)

IT 75-84-3, Neopentyl alcohol **77-99-6**, Trimethylolpropane **115-77-5**, Pentaerythritol, reactions 124-04-9, Hexanedioic acid, reactions 142-62-1, Hexanoic acid, reactions 143-07-7, Dodecanoic acid, reactions 25265-71-8, Dipropylene glycol
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(complex esters, **lubricant** formulations comprising these esters and use thereof)

REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L50 ANSWER 4 OF 9 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1998:762071 HCAPLUS

DOCUMENT NUMBER: 130:15685
TITLE: liquid additive packages containing multifunctional additives for liquid fuels, lubricants, and polymer formulations
INVENTOR(S): Dubs, Paul; Martin, Roger; Boss, Roland; Evans, Samuel
PATENT ASSIGNEE(S): Ciba Specialty Chemicals Holding, Inc., Switz.
SOURCE: Ger. Offen., 52 pp.
CODEN: GWXXBX
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 19820994	A1	19981119	DE 1998-19820994	199805 11
			<--	
GB 2325239	A	19981118	GB 1998-9252	199805 01
			<--	
GB 2325239	B	20010808		
CA 2237279	A1	19981113	CA 1998-2237279	199805 11
			<--	
FR 2763340	A1	19981120	FR 1998-5956	199805 12
			<--	
FR 2763340	B1	20000609		
IT 1299224	B1	20000229	IT 1998-MI1029	199805 12
			<--	
MX 9803740	A	20000630	MX 1998-3740	199805 12
			<--	
JP 10316986	A	19981202	JP 1998-148470	199805 13
			<--	
PRIORITY APPLN. INFO.:			CH 1997-1123 A	199705 13
			<--	

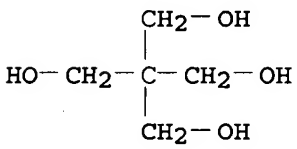
AB Liquid multifunctional additives, especially for use in fuels, lubricants, and polymer formulations, consist of the reaction product of components, consisting of: (1) an active-hydrogen-containing compound, (2) a glyceride or glyceridic oil, (3) a hydroxy-substituted phenylcarboxylic acid, (4) a hydrocarbon oil solvent (typically C9-13-alkylbenzene or C12-20-alkane), and, optionally, a C1-18-alkyl (alkyl)acrylate ester. The active-hydrogen-containing component is suitably chosen from pentaerythritol, thiodiethylene glycol, 1,4-butanediol, 1,2-propanediol, diethylene glycol, triethylene

glycol, diethanolamine, or glycerin. Typical glyceridic oils are coconut oil, rape oil, sunflower oil, soybean oil, or castor oil. Component (3) is typically 3-(3'-tert-butyl-4'-hydroxy-5'-methylphenyl)propanoic acid Me ester, 3-(3',5'-di-tert-butyl-4'-hydroxyphenyl)propanoic acid Me ester, and Ar-CH2SCH2CO2Me (Ar = 3,5-di-tert-butyl-4-hydroxyphenyl). The additives especially have antiwear, antioxidant, and stabilizer (i.e., against heat, light, and oxygen) activity in liquid fuels, lubricating oils, hydraulic fluids, metalworking oils, and polyolefin or polystyrene copolymers.

IT **115-77-5D**, Pentaerythritol, reaction products with glycerin and fats and glyceridic oils
RL: MOA (Modifier or additive use); **RCT (Reactant)**; **RACT (Reactant or reagent)**; USES (Uses)
(additive package containing; packages containing liquid multifunctional additives for liquid fuels, **lubricants**, and polymers)

RN 115-77-5 HCAPLUS

CN 1,3-Propanediol, 2,2-bis(hydroxymethyl)- (CA INDEX NAME)



IC ICM C07C069-732
ICS C07C069-54; C07C323-52; C07C229-00; C10M129-74; C10M135-22; C10M133-02; C08K005-00; C10L001-10

ICA C07D211-10; C07D227-00; C07D493-04

CC 51-8 (Fossil Fuels, Derivatives, and Related Products)

IT Diesel fuel additives
Fuel oil additives
Gasoline additives
Lubricating grease additives
Lubricating oil additives
(multifunctional; packages containing liquid multifunctional additives for liquid fuels, lubricants, and polymers)

IT 56-81-5D, Glycerin, reaction products with fats and glyceridic oils and (di-tertbutyl-hydroxyphenyl)propionic acid Me ester 57-55-6D, 1,2-Propanediol, reaction products with glycerin and fats and glyceridic oils, uses 96-33-3D, Methyl acrylate, reaction products with fats and glyceridic oils and (di-tertbutyl-hydroxyphenyl)propionic acid Me ester 110-63-4D, 1,4-Butanediol, reaction products with glycerin and fats and glyceridic oils, uses 111-42-2D, Diethanolamine, reaction products with glycerin and fats and glyceridic oils 111-46-6D, Diethylene glycol, reaction products with glycerin and fats and glyceridic oils 111-48-8D, Thiodiethylene glycol, reaction products with glycerin and fats and glyceridic oils 112-27-6D, Triethylene glycol, reaction products with glycerin and fats and glyceridic oils **115-77-5D**, Pentaerythritol, reaction products with glycerin and fats and glyceridic oils 128-39-2D, 2,6-Di-tert-butylphenol, reaction products with fats and glyceridic oils and (di-tertbutyl-hydroxyphenyl)propionic acid Me ester 2219-82-1D, 2-tert-Butyl-6-methylphenol, reaction products with fats and glyceridic oils and (di-tertbutyl-hydroxyphenyl)propionic acid Me ester 6386-38-5D, Benzenepropanoic acid, 3,5-bis(1,1-dimethylethyl)-4-hydroxy-, methyl ester, reaction products with glycerin and fats and glyceridic oils 24794-55-6, Benzenepropanoic

acid, 3-(1,1-dimethylethyl)-4-hydroxy-5-methyl- 51511-20-7D,
Acetic acid, [[[3,5-bis(1,1-dimethylethyl)-4-hydroxyphenyl]methyl]thio]-, methyl ester, reaction products with glycerin and fats and glyceridic oils
RL: MOA (Modifier or additive use); **RCT (Reactant)**;
RACT (Reactant or reagent); USES (Uses)
(additive package containing; packages containing liquid multifunctional additives for liquid fuels, **lubricants**, and polymers)

L50 ANSWER 5 OF 9 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1998:414716 HCAPLUS
DOCUMENT NUMBER: 129:83615
TITLE: Biodegradable branched synthetic ester base stocks and highly biodegradable lubricants with good cold flow properties, good solubility with dispersants, and good lubricity formed therefrom
INVENTOR(S): Duncan, Carolyn Boggus; Meade, Leah Katherine
PATENT ASSIGNEE(S): Exxon Chemical Patents, Inc., USA
SOURCE: U.S., 18 pp., Cont.-in-part of U.S. Ser. No. 351,990, abandoned.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 8
PATENT INFORMATION:

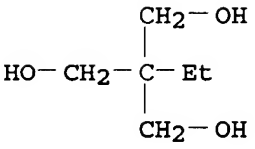
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 5767047	A	19980616	US 1995-569272	199512 08 <--
CA 2207393	A1	19960613	CA 1995-2207393	199512 08 <--
CA 2208217	A1	19960613	CA 1995-2208217	199512 08 <--
CN 1172497	A	19980204	CN 1995-197294	199512 08 <--
CN 1068900	B	20010725		
CN 1173195	A	19980211	CN 1995-197392	199512 08 <--
CN 1056874	B	20000927		
CN 1173196	A	19980211	CN 1995-197393	199512 08 <--
CN 1064703	B	20010418		
CN 1173197	A	19980211	CN 1995-197399	199512 08 <--

ES 2165440	T3	20020316	ES 1995-943099	199512 08 <--
PT 796308	T	20020328	PT 1995-943099	199512 08 <--
PT 802962	T	20020830	PT 1995-943770	199512 08 <--
ES 2173213	T3	20021016	ES 1995-943770	199512 08 <--
ES 2174979	T3	20021116	ES 1995-943098	199512 08 <--
CN 1277249	A	20001220	CN 2000-102602	200002 24 <--
CN 1288941	A	20010328	CN 2000-117902	200005 25 <--
CN 1109737	B	20030528		
PRIORITY APPLN. INFO.:			US 1994-351990 B2	199412 08 <--

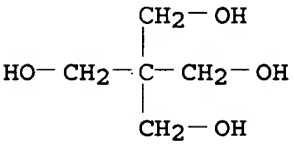
AB A biodegradable lubricant which is prepared from: .apprx.60-99% by weight of at least one biodegradable synthetic ester base stock which comprises the reaction product of: a branched or linear alc. having the general formula R(OH)n, wherein R is an aliphatic or cyclo-aliphatic group having from .apprx.2 to 20 carbon atoms and n is at least 2; and mixed acids comprising .apprx.30 to 80 M % of a linear acid having a carbon number in the range between about C5 to C12, and .apprx.20 to 70 M % of at least one branched acid having a carbon number in the range between about C5 to C10 and wherein no >10% of the branched acids used to form the biodegradable synthetic ester base stock contains a quaternary carbon; wherein the ester base stock exhibits the following properties: at least 60% biodegrdn. in 28 days as measured by the Modified Sturm test; a pour point of less than -25°.; a viscosity of <7500 cps at -25°.; and oxidative stability of up to 45 min as measured by HPDSC.

IT **77-99-6**, Trimethylolpropane **115-77-5**, Pentaerythritol, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(biodegradable branched synthetic ester base stocks and highly biodegradable **lubricants** with good cold flow properties, good solubility with dispersants, and good **lubricity** formed therefrom)

RN 77-99-6 HCAPLUS
CN 1,3-Propanediol, 2-ethyl-2-(hydroxymethyl)- (CA INDEX NAME)



RN 115-77-5 HCAPLUS
CN 1,3-Propanediol, 2,2-bis(hydroxymethyl)- (CA INDEX NAME)



IC ICM C10M129-70
ICS C10M129-74
INCL 508485000
CC 51-8 (Fossil Fuels, Derivatives, and Related Products)
IT Drilling fluids
Hydraulic fluids
Lubricants
Lubricating greases
Lubricating oils
(biodegradable branched synthetic ester base stocks and highly biodegradable lubricants with good cold flow properties, good solubility with dispersants, and good lubricity formed therefrom)
IT **77-99-6**, Trimethylolpropane **115-77-5**,
Pentaerythritol, reactions 25103-52-0, Cekanoic c8 acid
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(biodegradable branched synthetic ester base stocks and highly biodegradable **lubricants** with good cold flow properties, good solubility with dispersants, and good **lubricity** formed therefrom)
REFERENCE COUNT: 28 THERE ARE 28 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L50 ANSWER 6 OF 9 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1997:499166 HCAPLUS
DOCUMENT NUMBER: 127:178622
TITLE: High stability and low metals esters based on 3,5,5-trimethyl-1-hexanol
INVENTOR(S): Schlosberg, Richard H.; Turner, David W.; Krevalis, Martin A.; Munley, William J., Jr.; Aldrich, Haven S.
PATENT ASSIGNEE(S): Exxon Chemical Patents Inc., USA
SOURCE: PCT Int. Appl., 50 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE

WO 9726238 A1 19970724 WO 1997-US660
199701
16
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W: AL, AU, BA, BB, BG, BR, CA, CN, CU, CZ, EE, GE, HU, IL, IS, JP, KP, KR, LK, LR, LT, LV, MG, MK, MN, MX, NO, NZ, PL, RO, SG, SI, SK, TR, TT, UA, UZ, VN, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM
RW: KE, LS, MW, SD, SZ, UG, AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG
US 5798319 A 19980825 US 1996-586117
199601
16
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CA 2242389 A1 19970724 CA 1997-2242389
199701
16
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AU 9722427 A 19970811 AU 1997-22427
199701
16
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AU 720560 B2 20000601
EP 880495 A1 19981202 EP 1997-905578
199701
16
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R: BE, DE, FR, GB, IT, SE
CN 1211236 A 19990317 CN 1997-192206
199701
16
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CN 1093851 B 20021106
BR 9706996 A 19990720 BR 1997-6996
199701
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JP 2000516970 T 20001219 JP 1997-526166
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NO 9803257 A 19980715 NO 1998-3257
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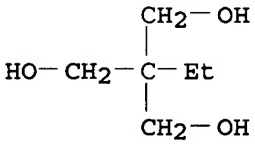
PRIORITY APPLN. INFO.: US 1996-586117 A
199601
16
<--
WO 1997-US660 W
199701
16
<--
OTHER SOURCE(S): MARPAT 127:178622
AB A lubricant which is prepared from at least one synthetic ester composition exhibiting thermal and oxidative stability comprises the reaction product of: 3,5,5-trimethyl-1-hexanol and an acid or anhydride; and a lubricant additive package; whereby the incorporation of an

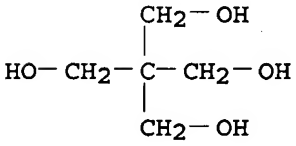
antioxidant in the lubricant additive package for the purpose of maintaining oxidative and thermal stability of the crankcase lubricating oil formulation to >20 min as measured by HPDSC at 220°, 3.445 MPa air and 0.5 weight% dioctyl di-Ph amine can be either reduced or eliminated. The synthetic ester composition preferably exhibits the following addnl. properties: a metals content of <10 ppm, an ash content of <15 ppm, a total acid number of <0.05 mg KOH/g, and a volume resistivity of .gtorsim.1 x 1011 ω-cm.

IT **77-99-6 115-77-5**, reactions **115-77-5D**, tech. **126-58-9**, Dipentaerythritol
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(in preparation of high-stability and low-metal esters based on 3,5,5-trimethyl-1-hexanol for **lubricating** compns.)

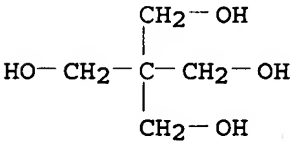
RN 77-99-6 HCAPLUS
CN 1,3-Propanediol, 2-ethyl-2-(hydroxymethyl)- (CA INDEX NAME)



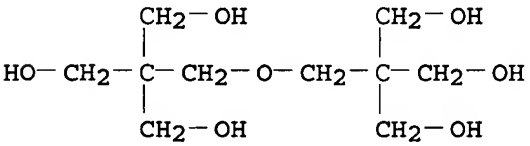
RN 115-77-5 HCAPLUS
CN 1,3-Propanediol, 2,2-bis(hydroxymethyl)- (CA INDEX NAME)



RN 115-77-5 HCAPLUS
CN 1,3-Propanediol, 2,2-bis(hydroxymethyl)- (CA INDEX NAME)



RN 126-58-9 HCAPLUS
CN 1,3-Propanediol, 2,2'-[oxybis(methylene)]bis[2-(hydroxymethyl)- (9CI) (CA INDEX NAME)



IC ICM C07C069-44
ICS C07C069-80; C07C069-82; C07C069-76; C10M105-32; C10M171-00;

C09K007-06; C07C067-08; C10M169-04
CC 51-8 (Fossil Fuels, Derivatives, and Related Products)
IT Drilling fluids
Hydraulic fluids
Lubricating greases
(high-stability and low-metal esters based on 3,5,5-trimethyl-1-hexanol for lubricating compns.)
IT 57-55-6, 1,2-Propanediol, reactions 77-84-9 77-85-0, Trimethylolethane **77-99-6** 107-21-1, 1,2-Ethanediol, reactions 110-63-4, 1,4-Butanediol, reactions **115-77-5**, reactions **115-77-5D**, tech. 126-30-7 **126-58-9**, Dipentaerythritol 7426-71-3, Trimethylolbutane
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(in preparation of high-stability and low-metal esters based on 3,5,5-trimethyl-1-hexanol for **lubricating** compns.)

L50 ANSWER 7 OF 9 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1996:685316 HCAPLUS
DOCUMENT NUMBER: 125:304802
TITLE: Polyol ester compositions with unconverted hydroxyl groups
INVENTOR(S): Schlosberg, Richard Henry; Aldrich, Haven S.; Sherwood-Williams, Lavonda Denise; Szobota, John S.; Krevalis, Martin Anthony; Leta, Daniel P.; Holt, David G. L.; Gordon, Fay H.
PATENT ASSIGNEE(S): Exxon Chemical Patents Inc., USA
SOURCE: PCT Int. Appl., 62 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9628525	A1	19960919	WO 1996-US3518	199603 14
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W: AU, BR, CA, CN, FI, JP, NO, PL, SG RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
US 5665686	A	19970909	US 1995-403366	199503 14
			<--	
CA 2214350	A1	19960919	CA 1996-2214350	199603 14
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AU 9653641	A	19961002	AU 1996-53641	199603 14
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AU 712058	B2	19991028		
BR 9607236	A	19971111	BR 1996-7236	199603 14
			<--	

EP 815186	A1	19980107	EP 1996-910450	199603 14
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EP 815186	B1	20050209		
R: AT, BE, CH, DE, DK, FR, GB, IT, LI, LU, NL, SE				
EP 835922	A1	19980415	EP 1997-203762	199603 14
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R: AT, BE, CH, DE, DK, FR, GB, IT, LI, LU, NL, SE				
CN 1188504	A	19980722	CN 1996-193463	199603 14
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CN 1089110	B	20020814		
JP 11501969	T	19990216	JP 1996-527829	199603 14
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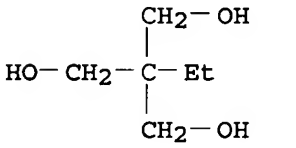
AT 288954	T	20050215	AT 1996-910450	199603 14
			<--	
NO 9704223	A	19971105	NO 1997-4223	199709 12
			<--	
FI 9703689	A	19971111	FI 1997-3689	199709 15
			<--	
CN 1302855	A	20010711	CN 2000-108763	200005 31
			<--	
CN 1109736	B	20030528		
PRIORITY APPLN. INFO.:			US 1995-403366 A	199503 14
			<--	
			EP 1996-910450 A3	199603 14
			<--	
			WO 1996-US3518 W	199603 14
			<--	

OTHER SOURCE(S): MARPAT 125:304802

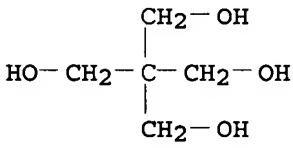
AB A synthetic ester composition which exhibits thermal and oxidative stability, lower friction coefficient, and lower wear, comprises the reaction product of a branched or linear alc. having the general formula R(OH)n, wherein R is an aliphatic or cycloaliph. group having 2-20 carbon atoms and n is at least 2; and at least one branched monocarboxylic acid which has a C number of 5-13; wherein the synthetic ester composition has .apprx.5-35% unconverted hydroxyl groups, based on the total amount of hydroxyl groups in the branched or linear alc. The polyol ester composition can be used in the formulation of various lubricants.

IT **77-99-6**, Trimethylolpropane **115-77-5**, Pentaerythritol, reactions **115-77-5D**, Pentaerythritol, tech. **126-58-9**, Dipentaerythritol
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(in preparation of polyol ester compns. with unconverted hydroxyl groups for **lubricants** with enhanced thermal/oxidative stability)

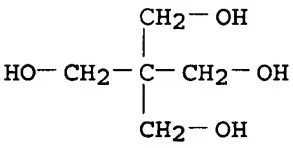
RN 77-99-6 HCAPLUS
CN 1,3-Propanediol, 2-ethyl-2-(hydroxymethyl)- (CA INDEX NAME)



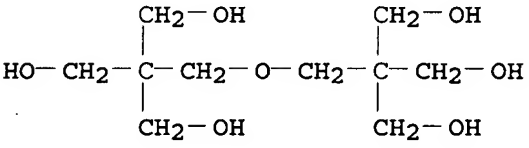
RN 115-77-5 HCAPLUS
CN 1,3-Propanediol, 2,2-bis(hydroxymethyl)- (CA INDEX NAME)



RN 115-77-5 HCAPLUS
CN 1,3-Propanediol, 2,2-bis(hydroxymethyl)- (CA INDEX NAME)



RN 126-58-9 HCAPLUS
CN 1,3-Propanediol, 2,2'-[oxybis(methylene)]bis[2-(hydroxymethyl)- (9CI) (CA INDEX NAME)



IC ICM C10M105-40
ICS C10M169-04; C10M105-54
CC 51-8 (Fossil Fuels, Derivatives, and Related Products)
IT Drilling fluids and muds
Hydraulic fluids
Lubricating greases
(polyol ester compns. with unconverted hydroxyl groups with enhanced thermal/oxidative stability for)

IT 50-70-4, Sorbitol, reactions 56-81-5, Glycerol, reactions 57-55-6, Propylene glycol, reactions 64-19-7, Acetic acid, reactions 75-98-9, 2,2-Dimethylpropionic acid 77-84-9 77-85-0, Trimethylolethane **77-99-6**, Trimethylolpropane 78-24-0, Tripentaerythritol 79-09-4, Propionic acid, reactions 107-21-1, Ethylene glycol, reactions 110-63-4, 1,4-Butanediol, reactions 111-14-8, Heptanoic acid 111-20-6, Sebacic acid, reactions 112-05-0, Nonanoic acid **115-77-5**, Pentaerythritol, reactions **115-77-5D**, Pentaerythritol, tech. 123-99-9, Azelaic acid, reactions 124-04-9, Adipic acid, reactions 124-07-2, Octanoic acid, reactions 126-30-7, Neopentyl glycol **126-58-9**, Dipentaerythritol 149-57-5, 2-Ethylhexanoic acid 334-48-5, Decanoic acid 646-07-1, Isohexanoic acid 693-23-2, Dodecanedioic acid 1330-19-4, Isoheptanoic acid 2163-42-0, 2-Methyl-1,3-propanediol 3302-10-1, 3,5,5-Trimethylhexanoic acid 7426-71-3, Trimethylolbutane 25103-52-0, Isooctanoic acid 26403-17-8, Isodecanoic acid 26896-18-4, Isononanoic acid 26896-20-8, Neodecanoic acid 33113-10-9, Neoheptanoic acid 59354-78-8, Neononanoic acid 101962-32-7, Neooctanoic acid
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(in preparation of polyol ester compns. with unconverted hydroxyl groups for **lubricants** with enhanced thermal/oxidative stability)

L50 ANSWER 8 OF 9 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1996:632116 HCAPLUS
DOCUMENT NUMBER: 125:252691
TITLE: Biodegradable lubricating base oil, lubricating oil composition containing the same and use thereof
INVENTOR(S): Inaya, Shuichi; Sawada, Hiroki; Kobayashi, Yuichiro; Hagihara, Toshiya
PATENT ASSIGNEE(S): Kao Corporation, Japan
SOURCE: PCT Int. Appl., 70 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9625474	A1	19960822	WO 1996-JP320	199602 13
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W: CN, US				
RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
JP 09217074	A	19970819	JP 1996-50934	199602 13
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JP 3759781	B2	20060329		
EP 809685	A1	19971203	EP 1996-901999	199602 13
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EP 809685	B1	20061025		

R: DE, ES, FR, GB

CN 1181103	A	19980506	CN 1996-193211	199602 13 <--
CN 1085243	B	20020522		
US 5916854	A	19990629	US 1997-875899	199708 07 <--
JP 2005281707	A	20051013	JP 2005-184125	200506 23 <--

PRIORITY APPLN. INFO.:

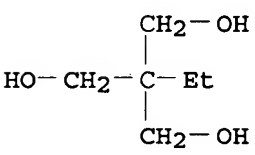
JP 1995-50495	A	199502 14 <--
JP 1995-129766	A	199504 28 <--
JP 1995-345191	A	199512 06 <--
JP 1996-50934	A3	199602 13 <--
WO 1996-JP320	W	199602 13 <--

AB The present invention describes a biodegradable lubricating base oil obtained by carrying out an addition reaction of an alkylene oxide and a transesterification in a mixture of fats and oils, a polyhydric alc. or an aliphatic carboxylic acid, and an alkylene oxide, the mixture containing 5 to 150 mol of the alkylene oxide to 1 mol of the fats and oils; a biodegradable lubricating base oil obtained by carrying out esterification of all or part of the hydroxyl group in the above fats and oils derivative using an aliphatic carboxylic acid or ester derivative thereof. Further, a biodegradable lubricating oil composition containing the biodegradable lubricating base oil and the use thereof are also described.

IT **77-99-6**, Trimethylolpropane
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(biodegradable **lubricating** base oil, **lubricating** oil composition containing the same and use thereof)

RN 77-99-6 HCAPLUS

CN 1,3-Propanediol, 2-ethyl-2-(hydroxymethyl)- (CA INDEX NAME)



IC ICM C10M101-04
ICS C10M111-00; C10M109-02
ICI C10M111-00, C10M101-00, C10M101-04; C10N040-08, C10N070-00
CC 51-8 (Fossil Fuels, Derivatives, and Related Products)
IT Hydraulic fluids
Lubricating greases
(biodegradable **lubricating** base oil, lubricating oil composition containing the same and use thereof)
IT 56-81-5, Glycerol, reactions 57-10-3, Palmitic acid, reactions 67-56-1, Methanol, reactions 75-21-8, Ethylene oxide, reactions **77-99-6**, Trimethylolpropane 124-07-2, Caprylic acid, reactions 149-57-5, 2-Ethylhexanoic acid 1310-58-3, Potassium hydroxide, reactions 9003-29-6, Polybutene 150872-29-0, Empol 1008
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(biodegradable **lubricating** base oil, **lubricating** oil composition containing the same and use thereof)

L50 ANSWER 9 OF 9 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1996:431444 HCAPLUS
DOCUMENT NUMBER: 125:91042
TITLE: High oleic polyol esters, compositions and lubricants, functional fluids and greases containing the same
INVENTOR(S): Lawate, Saurabh Shripad; Lal, Kasturi
PATENT ASSIGNEE(S): Lubrizol Corp., USA
SOURCE: Eur. Pat. Appl., 35 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 712834	A1	19960522	EP 1995-308145	199511 14
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EP 712834	B1	19990714		
R: BE, DE, ES, FR, GB, IT, NL, SE				
BR 9504838	A	19971007	BR 1995-4838	199510 17
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CA 2162441	A1	19960516	CA 1995-2162441	199511 08
			<--	
JP 08208563	A	19960813	JP 1995-290190	199511 08
			<--	
AU 9537780	A	19960523	AU 1995-37780	199511 10
			<--	
AU 697824	B2	19981015		
ES 2136805	T3	19991201	ES 1995-308145	

199511
14
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US 5773391 A 19980630 US 1997-966769
199711
07
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PRIORITY APPLN. INFO.: US 1994-339821 A
199411
15
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US 1997-794105 B1
199702
03
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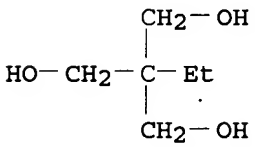
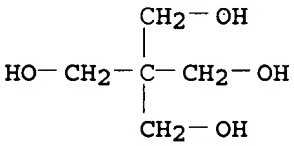
AB A polyol ester is described which is derived from: (A) an aliphatic or alicyclic polyol: and (B) an aliphatic monocarboxylic mixture derived from a natural vegetable oil, said acid mixture comprising at least .apprx.72% by weight of oleic acid. The invention also relates to compns. comprising the polyol esters and at least one antioxidant, and lubricating oil compns. comprising an oil of lubricating viscosity and the polyol esters of the invention. Lubricating oil compns. comprising polyol esters of the invention, at least one antioxidant, and an oil of lubricating viscosity also are described and are particularly useful.

IT **77-99-6**, Trimethylolpropane **115-77-5**, Pentaerythritol, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(high oleic polyol esters, compns. and **lubricant**,s functional fluids and greases containing the same)

RN 77-99-6 HCAPLUS
CN 1,3-Propanediol, 2-ethyl-2-(hydroxymethyl)- (CA INDEX NAME)



RN 115-77-5 HCAPLUS
CN 1,3-Propanediol, 2,2-bis(hydroxymethyl)- (CA INDEX NAME)



IC ICM C07C069-52
ICS C10M105-38; C07C067-62; C10M129-10; C10M133-12; C10M133-40
CC 51-8 (Fossil Fuels, Derivatives, and Related Products)
IT **Lubricating greases**
Lubricating oils
(high oleic polyol esters, compns. and lubricant,s functional fluids and greases containing the same)
IT 75-75-2, Methane sulfonic acid **77-99-6**, Trimethylolpropane

107-21-1, Ethylene glycol, reactions 112-80-1, Oleic acid, reactions **115-77-5**, Pentaerythritol, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(high oleic polyol esters, compns. and **lubricant**,s functional fluids and greases containing the same)

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L52 ANSWER 1 OF 18 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:1128691 HCAPLUS
DOCUMENT NUMBER: 142:59484
TITLE: **Lubricating grease** composition for roller bearings
INVENTOR(S): Iso, Kenichi; Naka, Michiharu; Kinoshita, Hirotsugu; Sakamoto, Kiyomi
PATENT ASSIGNEE(S): NSK Ltd., Japan; Nippon Oil Corporation
SOURCE: Jpn. Kokai Tokkyo Koho, 21 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004359809	A	20041224	JP 2003-159583	20030604

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PRIORITY APPLN. INFO.: JP 2003-159583 20030604

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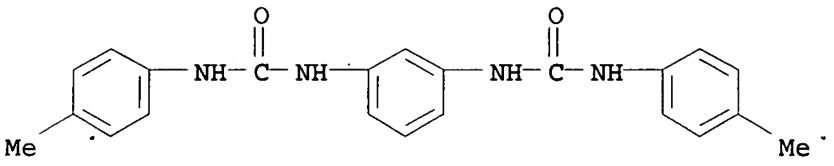
AB The title composition comprises a lubricating base oil containing synthetic esters, a thickener containing diurea compds. of formula: R1NHCONHR2NHCONHR1 (R1 = alkyl group; R2 = alkylene group), and 4-12 weight% of additives containing ≥1 phenol compds., amine compds., S compds. or P compds. The base oil contains mainly dialkyldiphenyl esters and has a kinematic viscosity of 10-400 mm2/s, preferably 20-250 mm2/s at 40°. The composition is superior in durability and lubricity for roller bearings under conditions of high temperature, high speed and extreme-pressure load.

IT **122870-29-5**
RL: MOA (Modifier or additive use); USES (Uses)
(**antiwear** additives containing; **lubricating grease** composition for roller bearings)

RN 122870-29-5 HCAPLUS
CN Urea, N,N''-(methyl-1,3-phenylene)bis[N'-(4-methylphenyl)- (9CI) (CA INDEX NAME)



D1—Me

IC ICM C10M169-02
ICS C10M101-02; C10M105-18; C10M107-34; C10M115-08; C10M129-10; C10M133-12; C10M135-36; C10M137-10; F16C033-66; C10N010-04; C10N030-06; C10N030-08; C10N040-02; C10N050-10
CC 51-8 (Fossil Fuels, Derivatives, and Related Products)
ST **lubricating grease** diurea thickener roller bearing
IT Bearings
(roller; **lubricating grease** composition for roller bearings)
IT **Lubricating grease** additives
(thickeners; **lubricating grease** composition for roller bearings)
IT 90-30-2, n-Phenyl-1-naphthylamine 101-67-7, p,p'-Dioctyldiphenylamine 18984-88-8 19210-06-1 97746-57-1 113634-59-6 **122870-29-5** 133336-92-2 169472-91-7 187333-36-4 **187486-01-7** 544696-53-9 544696-54-0
RL: MOA (Modifier or additive use); USES (Uses)
(**antiwear** additives containing; **lubricating grease** composition for roller bearings)
IT 101-84-8D, Diphenyl ether, C8-20 dialkyl derivs.
RL: MOA (Modifier or additive use); USES (Uses)
(**lubricating grease** composition for roller bearings)
IT 101-68-8D, Diphenylmethanediisocyanate, reaction products with alkylamines 108-91-8D, Cyclohexylamine, reaction products with diphenylmethanediisocyanate 124-30-1D, Stearylamine, reaction products with diphenylmethanediisocyanate 624-40-8, Diurea
RL: MOA (Modifier or additive use); USES (Uses)
(thickener; **lubricating grease** composition for roller bearings)

L52 ANSWER 2 OF 18 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2003:693591 HCAPLUS
DOCUMENT NUMBER: 139:199778
TITLE: **Lubricating grease** composition for resin contact surface of automobile parts or household appliances
INVENTOR(S): Segawa, Yoichi; Shimura, Akihiko; Hashimoto, Tatsuya
PATENT ASSIGNEE(S): NOK Kluber Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2003246996	A	20030905	JP 2002-50738	20020227

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PRIORITY APPLN. INFO.: JP 2002-50738 20020227

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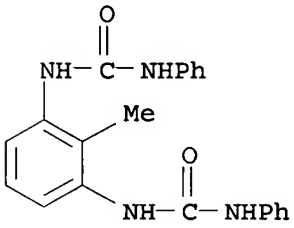
AB The title composition comprises a lubricating base oil having kinematic viscosity 5-3000 mm2/s, a thickener containing metal soaps or urea compds., a corrosion inhibitor containing sarcosine derivs., and/or a phenol-series antioxidant. The composition is superior in durability and lubricity for resin-resin or resin-metal contact surface of automobile parts or household appliances.

IT **149358-54-3**
RL: MOA (Modifier or additive use); USES (Uses)
(thickener; **lubricating grease** composition for resin contact surface of automobile parts or household appliances)

RN 149358-54-3 HCAPLUS

CN Urea, N,N''-(2-methyl-1,3-phenylene)bis[N'-phenyl- (9CI) (CA INDEX NAME)



IC ICM C10M169-02
ICS C10M129-10; C10M129-70; C10M129-74; C10M133-06; C10N040-00; C10N050-10

CC 51-8 (Fossil Fuels, Derivatives, and Related Products)

ST **lubricating grease** lithium soap thickener automobile household appliance

IT **Lubricating grease** additives
(antioxidants, phenol-series; **lubricating grease** composition for resin contact surface of automobile parts or household appliances)

IT **Lubricating grease** additives
(corrosion inhibitors, sarcosine derivs.; **lubricating grease** composition for resin contact surface of automobile parts or household appliances)

IT Soaps
RL: MOA (Modifier or additive use); USES (Uses)
(lithium, thickener; **lubricating grease** composition for resin contact surface of automobile parts or household appliances)

IT Antioxidants
(**lubricating grease** additives, phenol-series; **lubricating grease** composition for resin contact surface of automobile parts or household appliances)

IT Corrosion inhibitors
(**lubricating grease** additives, sarcosine derivs.; **lubricating grease** composition for resin contact surface of automobile parts or household appliances)
IT Appliances
(**lubricating grease** composition for resin contact surface of automobile parts or household appliances)
IT **Lubricating grease** additives
(thickeners, metal soap or urea compds.; **lubricating grease** composition for resin contact surface of automobile parts or household appliances)
IT 1709-70-2 1843-03-4 27676-62-6
RL: MOA (Modifier or additive use); USES (Uses)
(antioxidant; **lubricating grease** composition for resin contact surface of automobile parts or household appliances)
IT 110-25-8 36060-61-4 56073-34-8D, C12-18 alkyl derivs.
RL: MOA (Modifier or additive use); USES (Uses)
(corrosion inhibitor; **lubricating grease** composition for resin contact surface of automobile parts or household appliances)
IT **149358-54-3**
RL: MOA (Modifier or additive use); USES (Uses)
(thickener; **lubricating grease** composition for resin contact surface of automobile parts or household appliances)

L52 ANSWER 3 OF 18 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1997:204545 HCAPLUS
DOCUMENT NUMBER: 126:201545
TITLE: **Lubricating grease** compositions having high traction coefficient
INVENTOR(S): Nakanishi, Hiroshi; Umemoto, Noboru; Nakamura, Yoshinobu
PATENT ASSIGNEE(S): Tonen Corp, Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 09013068	A	19970114	JP 1995-187785	199506 30 <--

PRIORITY APPLN. INFO.: JP 1995-187785 199506 30 <--

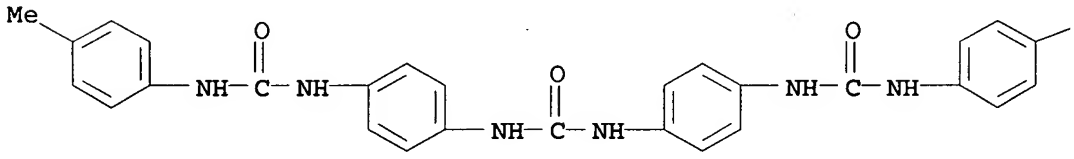
AB In the compns., thickeners are dispersed in base oils of (a) hydrogenated cyclopentadiene oligomers having weight-average mol. weight 200-300, and/or (b) polybutene having viscosity 5-1000 cSt at 40° . The compns. have improved fluidity and low low-temperature viscosity.
IT **187723-54-2**
RL: MOA (Modifier or additive use); USES (Uses)

(thickeners; **lubricating grease** compns. having high traction coefficient)

RN 187723-54-2 HCAPLUS

CN Urea, N,N'-bis[4-[[[(4-methylphenyl)amino]carbonyl]amino]phenyl]- (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 1-B

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IC ICM C10M169-02
ICS C10M105-04; C10M107-08; C10M169-02; C10M115-08; C10N020-02; C10N020-04; C10N030-02; C10N040-04; C10N050-10

CC 51-8 (Fossil Fuels, Derivatives, and Related Products)

ST **lubricating grease** base oil traction coeff; hydrogenated cyclopentadiene oligomer **lubricating grease**; polybutene **lubricating grease** base oil

IT **Lubricating greases**
(**lubricating grease** compns. having high traction coefficient)

IT **Lubricating grease** additives
(thickeners; **lubricating grease** compns. having high traction coefficient)

IT 9003-29-6, LV 50
RL: TEM (Technical or engineered material use); USES (Uses)
(base oil component, LV 25; **lubricating grease** compns. having high traction coefficient)

IT 26779-34-0D, Cyclopentadiene trimer, hydrogenated 54405-19-5D, hydrogenated
RL: TEM (Technical or engineered material use); USES (Uses)
(base oil component; **lubricating grease** compns. having high traction coefficient)

IT 25568-84-7D, Cyclopentadiene homopolymer, hydrogenated
RL: TEM (Technical or engineered material use); USES (Uses)
(oligomeric, base oil component; **lubricating grease** compns. having high traction coefficient)

IT 1340-69-8, Bentone 34 100408-54-6 **187723-54-2**
RL: MOA (Modifier or additive use); USES (Uses)
(thickeners; **lubricating grease** compns. having high traction coefficient)

L52 ANSWER 4 OF 18 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1994:275220 HCAPLUS
DOCUMENT NUMBER: 120:275220
TITLE: Urea-series grease compositions
INVENTOR(S): Ozaki, Koyo; Tanaka, Keiji; Tsucha, Tetsuo
PATENT ASSIGNEE(S): Showa Shell Sekiyu, Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

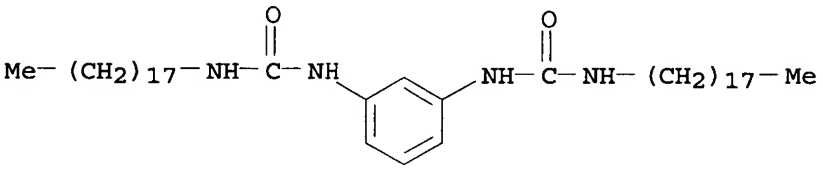
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 06017080	A	19940125	JP 1992-194946	19920629
			<--	
JP 2864473	B2	19990303		

PRIORITY APPLN. INFO.: JP 1992-194946 19920629
<--
OTHER SOURCE(S): MARPAT 120:275220

AB Urea-series grease compns. comprise 2-20 weight% thickeners of (a) diureas having the general formula R1NHCONHR2NHCONHR3 (R2 = tolylene group, R1 and R2 = C16-18 straight or branched saturated or unsatd. alkyl groups) and (b) diureas having the general formula R4NHCONHR5NHCONHR6 (R5 = diphenylmethane group, R4 and R6 = C8 straight or branched saturated alkyl groups) at (a)-(b) 20-90:1 mol ratio, in mineral oils and/or synthetic oils as the base oil.

IT **28805-02-9**
RL: USES (Uses)
(thickeners containing diurea mixts. of, for **lubricating greases**)

RN 28805-02-9 HCAPLUS
CN Urea, N,N''-(methyl-1,3-phenylene)bis[N'-octadecyl- (9CI) (CA INDEX NAME)



D1— Me

IC ICM C10M169-02
ICI C10M169-02, C10M101-02, C10M105-02, C10M115-08; C10N030-00, C10N030-02, C10N030-06, C10N040-02, C10N050-10
CC 51-8 (Fossil Fuels, Derivatives, and Related Products)
ST diurea thickener **grease lubricating**
IT **Lubricating grease** additives
(thickeners, diurea mixts.)
IT **28805-02-9** 122886-55-9
RL: USES (Uses)
(thickeners containing diurea mixts. of, for **lubricating greases**)

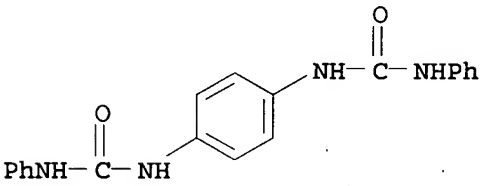
L52 ANSWER 5 OF 18 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1994:222227 HCAPLUS
DOCUMENT NUMBER: 120:222227
TITLE: **Lubricating greases** for sintered bearings
INVENTOR(S): Sato, Tasuku; Mori, Natsuhiko; Suzuki, Tatsuya
PATENT ASSIGNEE(S): Ntn Toyo Bearing Co Ltd, Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 05255685	A	19931005	JP 1992-52412	199203 11 <--

PRIORITY APPLN. INFO.: JP 1992-52412 199203 11 <--

AB The title greases comprise a mixed base oil containing (20-80):(20-80) weight ratio of alkyl di-Ph ethers and α-olefin polymers, and 0.1-5 weight% of a thickener containing aliphatic urea compound Thus, a mixed base oil containing 50:50 weight ratio of Moresco-Hilube BS-100 (an alkyl di-Ph ether) and HC-10 (an α-olefin polymer) and having kinematic viscosity 70 cSt at 40° was thickened with 1 weight% of an aliphatic urea (prepared from isocyanate and stearylamine) to form a highly durable **lubricating grease** with high thermal stability at 120° for ≥1100 h.

IT **13140-80-2**
RL: USES (Uses)
(thickener, **lubricating greases** containing, for sintered bearings)
RN 13140-80-2 HCAPLUS
CN Urea, N,N''-1,4-phenylenebis[N'-phenyl- (9CI) (CA INDEX NAME)



IC ICM C10M169-02
ICS F16C017-02; F16C033-10
ICI C10M169-02, C10M105-18, C10M105-04, C10M133-20; C10N030-06, C10N030-08, C10N040-02
CC 51-8 (Fossil Fuels, Derivatives, and Related Products)
ST **lubricating grease** sintered bearing urea; urea thickener **lubricating grease** bearing
IT **Lubricating greases**
(base oils, alkyl di-Ph ethers containing, for sintered bearings)

IT **Lubricating grease** additives
(thickeners, urea compds., for sintered bearings)
IT Alkenes, polymers
RL: USES (Uses)
(α-, polymers, mixed base containing, for **lubricating greases** for sintered bearings)
IT 9010-79-1 143179-68-4, Anderol 456 154281-08-0, Moresco-Hilube BS 100 154281-22-8, Reolube LPE 602
RL: USES (Uses)
(mixed base oil containing, for **lubricating greases** for sintered bearings)
IT 62-53-3D, Aniline, reaction products with isocyanates 108-91-8D, Cyclohexylamine, reaction products with isocyanates 124-30-1D, Stearylamine, reaction products with isocyanates **13140-80-2** 153788-23-9
RL: USES (Uses)
(thickener, **lubricating greases** containing, for sintered bearings)

L52 ANSWER 6 OF 18 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1992:452228 HCAPLUS
DOCUMENT NUMBER: 117:52228
TITLE: Manufacture of urea grease compositions for reduced squeaky noise from bearings
INVENTOR(S): Takemura, Kunio; Saito, Takashi
PATENT ASSIGNEE(S): Nippon Koyu Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 11 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 03231993	A	19911015	JP 1990-27221	199002 08
JP 07047753	B	19950524	<--	

PRIORITY APPLN. INFO.: JP 1990-27221 199002 08
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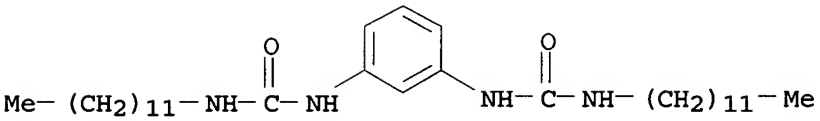
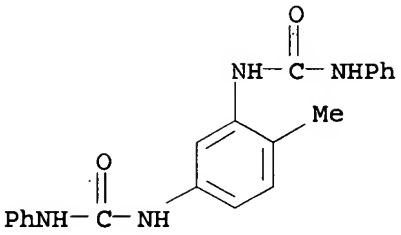
OTHER SOURCE(S): MARPAT 117:52228
AB The title compns. are manufactured by heating 70-98% base oil with 2-30% of urea compds. R1NHCONHR2NHCONHR3 (R1, R3 = C8-18 saturated alkyl; R2 = tolylene, C6H4CH2C6H4, dimethylbiphenylene) at 170-230° and cooling the mixture at ≥5 °C/s. The compns. show excellent thermal stability.
IT **133946-87-9**
RL: USES (Uses)
(thickener containing, for **lubricating greases** , for reduced squeaky noise from bearings)
RN 133946-87-9 HCAPLUS
CN Urea, N,N''-(methyl-1,3-phenylene)bis[N'-dodecyl- (9CI) (CA INDEX NAME)



D1—Me

IC ICM C10M115-08
ICI C10N030-00, C10N050-10, C10N070-00
CC 51-8 (Fossil Fuels, Derivatives, and Related Products)
ST bearing grease urea sound redn; thickener diurea **lubricating grease** bearing
IT **Lubricating grease** additives
(thickeners, diurea compds., for bearings)
IT 91-97-4D, reaction products with alkylamines 101-68-8D, MDI, reaction products with alkylamines 111-86-4D, Octylamine, reaction products with diisocyanates 124-22-1D, Dodecylamine, reaction products with diisocyanates 124-30-1D, Octadecylamine, reaction products with diisocyanates 584-84-9D, 2,4-TDI, reaction products with alkylamines 2016-42-4D, Tetradecylamine, reaction products with diisocyanates 3378-63-0D, 3,5,5-Trimethylhexylamine, reaction products with diisocyanates 43136-14-7 103522-96-9 128666-17-1 **133946-87-9** 138804-83-8 138804-84-9 138804-85-0 138804-86-1
RL: USES (Uses)
(thickener containing, for **lubricating greases** , for reduced squeaky noise from bearings)

L52 ANSWER 7 OF 18 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1991:562610 HCAPLUS
DOCUMENT NUMBER: 115:162610
TITLE: A study of greases based on polyureas
AUTHOR(S): Xie, Liangsen; Li, Hui
CORPORATE SOURCE: Yiping Chem. Works, SINOPEC, Chungking, Peop. Rep. China
SOURCE: Synthetic Lubrication (**1991**), 8(1), 39-50
CODEN: SYLUEB; ISSN: 0265-6582
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The effects of polyurea structures (diureas and tetraureas) and oil type (mineral, synthetic hydrocarbons, esters, polyoxyalkylenes) were studied on the characteristics of polyurea-thickened **lubricating greases.** The impacts of monoamines, diamines, and diisocyanates (chiefly TDI) used for polyurea synthesis on grease characteristics were also studied. In general, polyurea-thickened greases prepared from a variety of synthetic and mineral oils have high drop point, outstanding water resistance, high oxidation stability, and prolonged bearing life.
IT **60903-54-0**
RL: USES (Uses)
(**lubricating greases** thickened with, characteristics of)
RN 60903-54-0 HCAPLUS
CN Urea, N,N''-(4-methyl-1,3-phenylene)bis[N'-phenyl- (9CI) (CA INDEX NAME)



CC 51-8 (Fossil Fuels, Derivatives, and Related Products)
Section cross-reference(s): 38
ST **lubricating grease** polyurea property; dropping point **lubricating grease** polyurea; thickener **lubricating grease** polyurea
IT Polyureas
RL: USES (Uses)
(**lubricating greases** thickened with, characteristics of)
IT **Lubricating greases**
(polyurea-thickened, properties of, effects of thickeners and base oils on)
IT Siloxanes and Silicones, uses and miscellaneous
RL: USES (Uses)
(Me Ph, polyurea-thickened **lubricating greases** containing, characteristics of, effect of thickener and oil properties on)
IT Siloxanes and Silicones, uses and miscellaneous
RL: USES (Uses)
(di-Me, polyurea-thickened **lubricating greases** containing, characteristics of, effect of thickener and oil properties on)
IT Siloxanes and Silicones, uses and miscellaneous
RL: USES (Uses)
(di-Ph, polyurea-thickened **lubricating greases** containing, characteristics of, effect of thickener and oil properties on)
IT **Lubricating grease** additives
(thickeners, polyureas, properties of, effect of mol. structure on)
IT **60903-54-0 67144-13-2 129856-30-0 136494-40-1**
RL: USES (Uses)
(**lubricating greases** thickened with, characteristics of)
IT 71-43-2D, Benzene, alkyl derivs. 77-99-6D, Trimethylolpropane, esters 111-20-6D, Decanedioic acid, esters 115-77-5D, esters 126-58-9D, Dipentaerythritol, esters 25322-69-4D, Polypropylene glycol, esters
RL: USES (Uses)
(polyurea-thickened **lubricating greases** containing, characteristics of, effect of thickener and oil properties on)

L52 ANSWER 8 OF 18 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1991:231900 HCAPLUS
DOCUMENT NUMBER: 114:231900
TITLE: Diurea grease composition
INVENTOR(S): Kinoshita, Hirotugu; Sekiya, Makoto; Mishima,

Masaru
PATENT ASSIGNEE(S): Nippon Oil Co., Ltd., Japan
SOURCE: Eur. Pat. Appl., 18 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

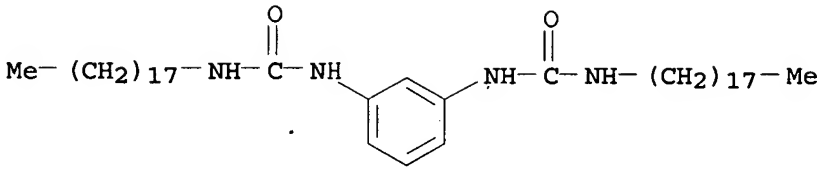
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 406894	A1	19910109	EP 1990-112952 <--	19900706
EP 406894 R: DE, FR, GB	B1	19931222		
JP 03128993	A	19910531	JP 1990-155338 <--	19900615
JP 2777928	B2	19980723		
US 5145591	A	19920908	US 1990-547880 <--	19900703

PRIORITY APPLN. INFO.: JP 1989-174084 A 19890707
<--
JP 1990-155338 A 19900615
<--

OTHER SOURCE(S): MARPAT 114:231900

AB A diurea grease composition contain a base oil and 2-25 weight% of a diurea compound The diurea grease compound is prepared by reacting a mixed system of ≥2 different diisocyanates of the formula OCNRNCO (R is a straight-chained or branched alkylene or alkenylene group, a cycloalkylene or an aromatic group) with an amine compound of a primary amine of the formula RNH2 (R = C6-20 hydrocarbyl), a secondary amine of the formula R2R3NH (R2 and R3 are C6-20 hydrocarbyl groups), or their mixts.

IT **28805-02-9**
RL: USES (Uses)
(preparation of diureas containing, thickeners, for **lubricating greases**)
RN 28805-02-9 HCAPLUS
CN Urea, N,N''-(methyl-1,3-phenylene)bis[N'-octadecyl- (9CI) (CA INDEX NAME)



D1—Me

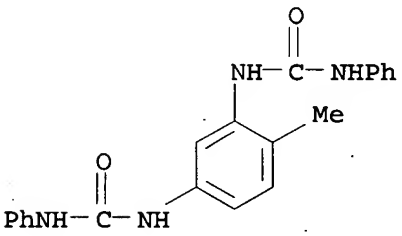
IC ICM C10M115-08
ICI C10N050-10
CC 51-8 (Fossil Fuels, Derivatives, and Related Products)
ST **lubricating grease** diurea compn; amine diisocyanate diurea **lubricating grease**
IT Amines, compounds
RL: USES (Uses)
(reaction products, with diisocyanates, for diurea thickeners, for **lubricating greases**)
IT **Lubricating grease** additives
(thickeners, diureas, from diisocyanates and amines, preparation of)
IT 91-97-4D, reaction products with diisocyanates and cyclohexylamine 98-94-2D, reaction products with MDI, tolylene, diisocyanate, eicosylamine and dicyclohexylamine 100-60-7D, Methylcyclohexylamine, reaction products with diisocyanates and amines 101-68-8D, reaction products with tolylene diisocyanate and amines 101-83-7D, Dicyclohexylamine, reaction products with MDI, tolylene, diisocyanate, octadecylamine, and cyclohexylamine 106-49-0D, p-Toluidine, reaction products with MDI, tolylene diisocyanate and octadecylamine 108-91-8D, Cyclohexanamine, reaction products with octadecylamine, dicyclohexylamine, MDI, and tolylene diisocyanate 111-86-4D, Octylamine, reaction products with diisocyanates and amines 124-22-1D, Laurylamine, reaction products with diisocyanates and amines 124-30-1D, Octadecylamine, reaction products with MDI, tolylene diisocyanate, cyclohexylamine, and dicyclohexylamine 822-06-0D, reaction products with dimethyldiphenyl diisocyanate and cyclohexylamine 2778-42-9D, reaction products with dimethyldiphenyl diisocyanate and cyclohexylamine 3634-83-1D, reaction products with MDI and cyclohexylamine 4098-71-9D, reaction products with MDI and cyclohexylamine 10525-37-8D, Eicosylamine, reaction products with MDI, tolylene, diisocyanate, dimethylcyclohexylamine, and dicyclohexylamine 26471-62-5D, Tolylene diisocyanate, reaction products with MDI and amines **28805-02-9** 43136-14-7 58890-25-8 **103479-09-0** 103522-96-9 **117617-72-8** **122870-29-5** 122886-55-9 127067-58-7 127194-10-9 **133176-45-1** 133176-46-2 133176-47-3 133176-48-4 133336-91-1 133336-92-2 133336-93-3 133336-94-4 **133946-87-9** 133946-88-0 133946-89-1
RL: USES (Uses)
(preparation of diureas containing, thickeners, for **lubricating greases**)

L52 ANSWER 9 OF 18 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1991:210183 HCAPLUS
DOCUMENT NUMBER: 114:210183
TITLE: A study of the greases based on polyureas

AUTHOR(S): Xie, Liangsen; Li, Hui
CORPORATE SOURCE: Yiping Chem. Works, SINOPEC, Chongqing, Peop. Rep. China
SOURCE: Proc. Conf. Synth. Lubr. (**1989**), 500-12. Editor(s): Zakar, Andras. Hung. Hydrocarbon Inst.: Szazhalombatta, Hung. CODEN: 56TUAO
DOCUMENT TYPE: Conference
LANGUAGE: English

AB Excellent greases were prepared from a variety of base oils thickened with urea compds. with different structures. Polyurea greases have high dropping point, prolonged bearing life, and excellent water resistance, oxidation stability, and colloidal stability. Three polyurea greases were developed and successfully applied.

IT **60903-54-0**
RL: USES (Uses)
(thickener, for **lubricating greases**)
RN 60903-54-0 HCAPLUS
CN Urea, N,N''-(4-methyl-1,3-phenylene)bis[N'-phenyl- (9CI) (CA INDEX NAME)



CC 51-8 (Fossil Fuels, Derivatives, and Related Products)
ST **lubricating grease** polyurea thickener
IT Esters, uses and miscellaneous
Hydrocarbons, uses and miscellaneous
Siloxanes and Silicones, uses and miscellaneous
RL: USES (Uses)
(**lubricating grease** performance in presence of, effect of polyurea thickeners on)
IT Polyureas
RL: USES (Uses)
(**lubricating grease** thickeners)
IT **Lubricating greases**
(polyurea-thickened, with high dropping points and oxidation and colloidal stability)
IT **Lubricating grease** additives
(thickeners, polyureas)
IT 101-68-8P 584-84-9P 822-06-0P
RL: PREP (Preparation)
(preparation of, for preparation of **lubricating grease** thickeners)
IT **60903-54-0 67144-13-2 129856-30-0**
129856-31-1 129856-32-2 129856-33-3
129856-34-4 129856-35-5 129856-36-6
129856-37-7 129856-38-8 129856-39-9
129856-40-2 129856-41-3 129856-42-4
129856-43-5 129856-44-6 129856-45-7
129856-46-8 129856-47-9 129856-48-0
129856-49-1 129856-50-4 129856-51-5

129877-94-7 **129877-96-9** 129877-97-0
RL: USES (Uses)
(thickener, for **lubricating greases**)

L52 ANSWER 10 OF 18 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1990:481954 HCAPLUS
DOCUMENT NUMBER: 113:81954
TITLE: Diurea thickeners and grease compositions with improved acoustic characteristics
INVENTOR(S): Ozaki, Koyo; Shimakawa, Yasuo; Tanaka, Keiji; Naka, Michiharu; Koizumi, Hideki; Suzuki, Toshiro
PATENT ASSIGNEE(S): Showa Shell Sekiyu K. K., Japan; Nippon Seiko K. K.
SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

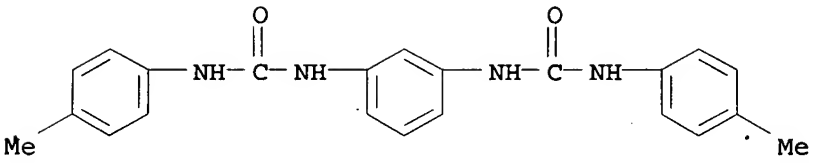
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 02077494	A	19900316	JP 1988-228493	19880914
JP 2546707	B2	19961023		

PRIORITY APPLN. INFO.: JP 1988-228493 19880914

AB Mineral or synthetic oil grease compns. contain, as thickeners, 2-30% diurea mixts. comprising (A) 20-90 mol% R1NHCONHR2NHCONHR3 [I; R1, R3 = C18 (un)saturated alkyl; R2 = bitolylene], (B) 20-90 mol% R4NHCONHC6H4CH2C6H4NHCONHR5 (R4, R5 = C8 saturated alkyl), and optionally (C) 5-90 parts (per 100 parts A + B) I [R1, R3 = alkaryl, haloaryl; R2 = (bi)tolylene]. The compns. have good thermal and mech. stability. Thus, a solution of 6.56 g 3,3'-bitolylene-4,4'-diisocyanate in mineral oil was treated with 13.22 g stearylamine for 10 min, then 2.08 g MDI was added followed by 2.14 g octylamine, and the mixture was kneaded to give a grease (containing 12% thickener) with consistency 268, dropping point 248°, and good acoustic properties, vs. 273, 258, and poor, resp., for the composition prepared without MDI and octylamine.

IT **122870-29-5**
RL: USES (Uses)
(thickener, for **lubricating greases**, for improved acoustic characteristics)

RN 122870-29-5 HCAPLUS
CN Urea, N,N''-(methyl-1,3-phenylene)bis[N'-(4-methylphenyl)- (9CI) (CA INDEX NAME)



D1— Me

IC ICM C10M115-08
ICI C10N030-00, C10N040-02, C10N050-10
CC 51-8 (Fossil Fuels, Derivatives, and Related Products)
ST urea thickener grease acoustic property; **lubricating grease** diurea thickener
IT **Lubricating grease** additives
(thickeners, diurea mixts., with good acoustic characteristics)
IT **122870-29-5 122870-30-8 122870-36-4**
122886-55-9 122886-56-0 122886-57-1 122886-58-2 128666-17-1
128666-18-2
RL: USES (Uses)
(thickener, for **lubricating greases**, for improved acoustic characteristics)

L52 ANSWER 11 OF 18 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1989:537387 HCAPLUS
DOCUMENT NUMBER: 111:137387
TITLE: Urea grease compositions
INVENTOR(S): Ozaki, Koyo; Shimakawa, Yasuo; Tanaka, Keiji
PATENT ASSIGNEE(S): Showa Shell Sekiyu K. K., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 01139696	A	19890601	JP 1987-296141	198711 26
			<--	
JP 06092592	B	19941116		

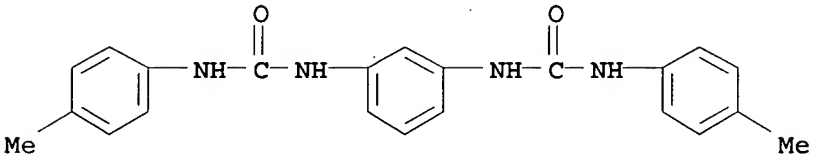
PRIORITY APPLN. INFO.: JP 1987-296141 198711 26
<--
OTHER SOURCE(S): MARPAT 111:137387
AB Mineral or synthetic oil grease contains, as thickener, 2-30% diurea mixts. comprising 10-95 mol% R1NHCONHC6H4CH2C6H4NHCONHR2 (R1, R2 = C8 saturated alkyl) and 5-90 mol% R3NHCONHR4NHCONHR5 (R3, R5 = alkaryl, haloaryl; R4 = tolylene, bitolylene). The compns. have high dropping point, excellent heat resistance, and good acoustic characteristics. Thus, 2.57 g p-toluidine was added to a mixture of 3.16 g 3,3'-bitolylene-4,4'-diisocyanate and mineral oil at 80°, then 8.98 g MDI was added followed by 9.29 g octylamine,

and the mixture was kneaded to give a grease (containing 12% thickener) with consistency (at 25°) 270 and dropping point >260°, vs., 265 and 221°, resp., for grease prepared from MDI and octylamine.

IT **122870-29-5**
RL: USES (Uses)
(thickener containing, for **lubricating greases**)

RN 122870-29-5 HCAPLUS

CN Urea, N,N''-(methyl-1,3-phenylene)bis[N'-(4-methylphenyl)- (9CI) (CA INDEX NAME)



D1— Me

IC ICM C10M115-08
ICS C10M169-02

ICI C10M169-02, C10M115-08, C10M107-10, C10M107-02; C10N020-02, C10N030-00, C10N050-10

CC 51-8 (Fossil Fuels, Derivatives, and Related Products)

ST **lubricating grease** thickener urea mixt

IT **Lubricating grease** additives
(thickeners, diurea mixts.)

IT **122870-29-5 122870-30-8 122870-36-4**
122886-55-9 122886-56-0 122886-57-1 122886-58-2
RL: USES (Uses)
(thickener containing, for **lubricating greases**)

L52 ANSWER 12 OF 18 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 1989:518009 HCAPLUS

DOCUMENT NUMBER: 111:118009

TITLE: **Lubricating grease** composition

INVENTOR(S): Kageyama, Hachiro; Moriuchi, Tsutomu; Kimura, Hiroshi; Endo, Toshiaki

PATENT ASSIGNEE(S): Kyodo Oils and Fats Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 12 pp.
CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 63312397	A	19881220	JP 1987-147888	198706 16

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PRIORITY APPLN. INFO.: JP 1987-147888 198706

16

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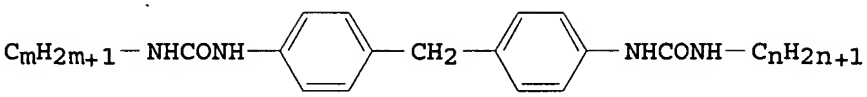
OTHER SOURCE(S): MARPAT 111:118009

GI



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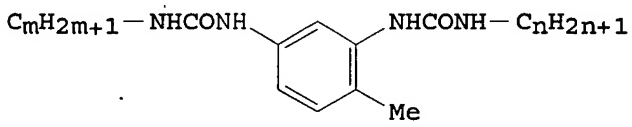

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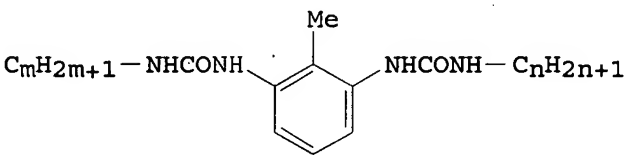


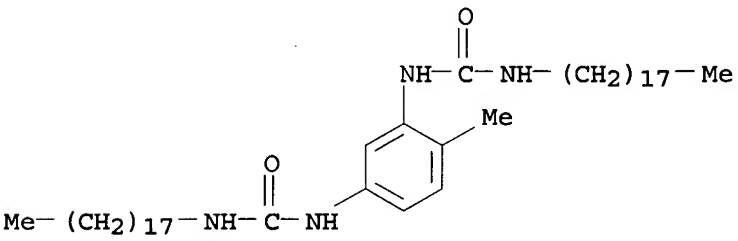
III

AB Thickeners for **lubricating greases** used in gears or elec. generator bearings, present at 1-10 weight% concentration, contain urea compds. having the following formulas I (CmH2m+1 and CnH2n+1 are independently straight-chain alkyl groups; m and n are an integer of 6-20, but m + n = 19-40), II or III (CmH2m+1 and CnH2n+1 are defined as above). Thus, a polyester base oil (kinematic viscosity 30 cSt at 40°) was thickened with 3.0 weight% of an urea compound (prepared by reacting stearylamine with MDI) to form a **lubricating grease**, which was then subjected to the 4-ball friction test, resulting in a wear scar of 0.70 mm, vs. 1.26 mm for a com. grease.

IT **67144-13-2P**
RL: PREP (Preparation)
(preparation of, thickener, for **lubricating greases**, for gears)

RN 67144-13-2 HCAPLUS

CN Urea, N,N''-(4-methyl-1,3-phenylene)bis[N'-octadecyl- (9CI) (CA INDEX NAME)



IC ICM C10M115-08
ICS C10M177-00

ICI C10N040-02, C10N050-10

CC 51-8 (Fossil Fuels, Derivatives, and Related Products)

ST **lubricating grease** thickener urea compd; isocyanate urea gear **lubricating grease**

IT **Lubricating grease** additives
(thickeners, urea compds., for gears)

IT 43136-14-7P **67144-13-2P** 103522-96-9P **117328-80-0P** 117328-85-5P 117328-87-7P
RL: PREP (Preparation)
(preparation of, thickener, for **lubricating greases**, for gears)

IT 101-68-8D, MDI, reaction products with C6-20 monoamines 106-49-0D, reaction products with diisocyanates 124-30-1D, Stearylamine, reaction products with diisocyanates 2016-42-4D, Tetradecylamine, reaction products with diisocyanates 26471-62-5D, TDI, reaction products with C6-20 monoamines
RL: USES (Uses)
(thickeners, for **lubricating greases**, for gears)

L52 ANSWER 13 OF 18 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1988:633979 HCAPLUS
DOCUMENT NUMBER: 109:233979
TITLE: Urea-urethane **lubricating grease** composition
INVENTOR(S): Kinoshita, Hirotsugo; Sekiya, Makoto; Mishima, Masaru
PATENT ASSIGNEE(S): Nippon Oil Co., Ltd., Japan
SOURCE: Eur. Pat. Appl., 10 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 274756	A2	19880720	EP 1987-119400 <--	19871230
EP 274756	A3	19881026		
EP 274756	B1	19901031		
R: DE, FR, GB				
JP 01009296	A	19890112	JP 1987-321491 <--	19871221
JP 06004863	B	19940119		
US 4915860	A	19900410	US 1989-328786 <--	19890323
PRIORITY APPLN. INFO.:			JP 1987-1763 A <--	19870109
			US 1988-141401 B1 <--	19880104

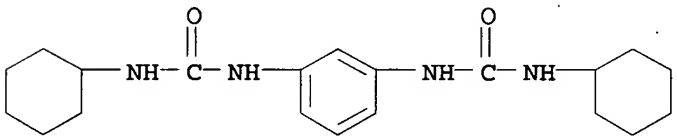
OTHER SOURCE(S): CASREACT 109:233979; MARPAT 109:233979

AB **Lubricating grease** thickener, present at 2-25 weight% concentration, contains a mixture of diurea compound of the general formula (R2NHCONH)2R1 (I) 20-99, urea-urethane compound of the general formula R2NHCONHR1NHCOOR3 (II) 4-30, and diurethane compound of the general formula (R3OOCNH)2R1 (III) 1-50 mol%, wherein R1 = difunctional aromatic hydrocarbon residue, R2 = cyclohexyl or C7-12 cyclohexyl-derived group, R3 = C8-20-alkyl or alkenyl group, the ratio of the number of amino groups to alkoxy groups in the mixture being 40-95:5-60. Thus, a grease composition containing 11 weight% of a urea-urethane mixture as a thickener comprising I (R1 = MeC6H3, R2 = cyclohexyl) 60, II (R2 = cyclohexyl, R3 = C18H37, R1 = MeC6H3 20, and III (R3 = C18H37, R1 = MeC6H3) 20 mol% (70:30 cyclohexylamino-octadecyloxy ratio) was subjected to the consistency, dropping point, and oil separation tests (JIS K 2220 5.3, 5.4, and 5.7 Methods), resulting in improved performance.

IT **117617-72-8**
RL: USES (Uses)
(thickeners containing, for **lubricating greases**)

RN 117617-72-8 HCAPLUS

CN Urea, N,N''-(methyl-1,3-phenylene)bis[N'-cyclohexyl- (9CI) (CA INDEX NAME)



D1—Me

IC ICM C10M115-08
ICI C10M115-08
CC 51-8 (Fossil Fuels, Derivatives, and Related Products)
ST **lubricating grease** thickness urea urethane
IT **Lubricating grease** additives
(thickeners, urea-urethane mixts.)
IT 28805-04-1 58890-25-8 84510-19-0 117617-71-7
117617-72-8 117702-99-5 117703-00-1 117703-01-2
117703-02-3
RL: USES (Uses)
(thickeners containing, for **lubricating greases**)

L52 ANSWER 14 OF 18 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1988:613445 HCAPLUS
DOCUMENT NUMBER: 109:213445
TITLE: **Lubricating grease** composition
INVENTOR(S): Nakanishi, Yukio; Kimura, Hiroshi; Suda, Mitsutaka
PATENT ASSIGNEE(S): Kyodo Oils and Fats Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 10 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 63179998	A	19880723	JP 1987-11365	19870122

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PRIORITY APPLN. INFO.: JP 1987-11365 19870122

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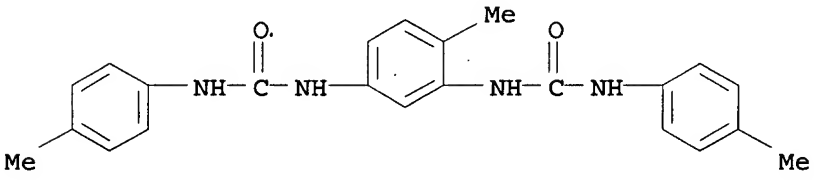
OTHER SOURCE(S): MARPAT 109:213445

AB **Lubricating greases** for mech. parts are prepared by thickening a base oil with 1-30 weight% of an urea compound having the structural formula R2UR1UR2 (U is the NHCONH group; R1 is an isocyanate residual group, alkyl, aryl or its derivs.; R2 is a monoamine residual group, alkyl, aryl, cycloalkyl or its derivs.). Thus, a polyolefin base oil was blended with 20.0 weight% a thickener (prepared by reacting TDI with hexylamine) to give a **lubricating grease**, which was then subjected to the four-ball friction test (JIS K 2220), resulting in a wear scar of 0.15 μm, vs. 0.74 μm for a com. grease.

IT **54390-87-3P**
RL: PREP (Preparation)
(preparation of, thickener, for **lubricating greases**, for mech. parts)

RN 54390-87-3 HCAPLUS

CN Urea, N,N''-(4-methyl-1,3-phenylene)bis[N'-(4-methylphenyl)- (9CI) (CA INDEX NAME)



IC ICM C10M115-08
ICS C10M119-24

ICA C10M177-00

ICI C10N050-10, C10N070-00

CC 51-8 (Fossil Fuels, Derivatives, and Related Products)

ST **lubricating grease** thickener urea compd; hexylamine TDI urea thickener grease

IT **Lubricating grease** additives
(thickeners, urea compds. as, for mech. parts)

IT 13140-83-5P **54390-87-3P 60903-54-0P 61657-50-9P** 103522-96-9P **117328-81-1P 117609-59-3P**
RL: PREP (Preparation)
(preparation of, thickener, for **lubricating greases**, for mech. parts)

IT 62-53-3D, Aniline, reaction products with isocyanate compds. 101-68-8D, reaction products with alkyl- or arylamines 106-49-0D, p-Toluidine, reaction products with isocyanate compds. 111-26-2D, Hexylamine, reaction products with isocyanate compds. 124-22-1D,

Dodecylamine, reaction products with isocyanate compds.
26471-62-5D, TDI, reaction products with alkyl- or arylamines
RL: USES (Uses)
(thickener, for **lubricating greases**)

L52 ANSWER 15 OF 18 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1988:593588 HCAPLUS
DOCUMENT NUMBER: 109:193588
TITLE: **Lubricating grease** compositions
INVENTOR(S): Kageyama, Hachiro; Moriuchi, Tsutomu; Endo, Toshiaki
PATENT ASSIGNEE(S): Kyodo Oils and Fats Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 63162790	A	19880706	JP 1986-308906	198612 26

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PRIORITY APPLN. INFO.: JP 1986-308906 198612 26

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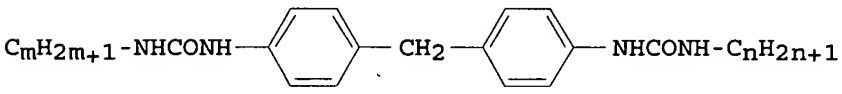
OTHER SOURCE(S): MARPAT 109:193588
GI



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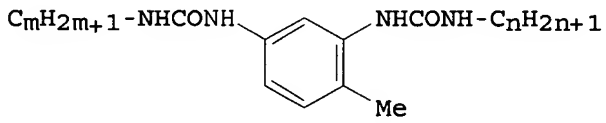

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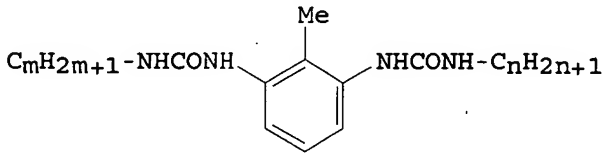


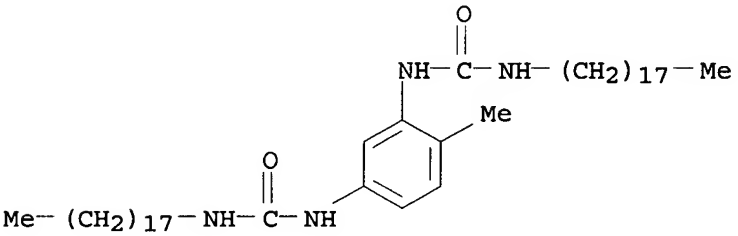
III

AB **Lubricating greases** especially useful for reducing squeaky noise from small-diameter bearings are prepared by homogenizing a base oil with 5-40 weight% of a thickener containing urea compound having the structural formula I (CmH2m+1 and CnH2n+1 are straight-chain alkyl groups, but m + n is 19-40), II or III (CmH2m+1 and CnH2n+1 are

straight-chain alkyl groups, but m + n is 16-40). The urea compound is preferably prepared by reacting an isocyanate (e.g., MDI or TDI) with a C6-20 fatty amine. Thus, an ester base oil was homogenized with 15 weight% of an urea compound thickener (prepared by reacting MDI with n-octadecylamine and n-octylamine) to form a **lubricating grease** with dropping point 200°, vs. 283° for a conventional grease.

IT **67144-13-2P**
RL: PREP (Preparation)
(preparation of, thickener, for **lubricating greases**, for reducing squeaky noise from small-diameter bearings)

RN 67144-13-2 HCAPLUS
CN Urea, N,N''-(4-methyl-1,3-phenylene)bis[N'-octadecyl- (9CI) (CA INDEX NAME)



IC ICM C10M115-08
ICS C10M119-24
ICI C10N040-02, C10N050-10
CC 51-8 (Fossil Fuels, Derivatives, and Related Products)
ST **lubricating grease** squeaky noise axle; diurea thickener grease TDI alkylamine
IT **Lubricating grease** additives
(thickeners, urea compds. as, for reducing squeaky noise from small-diameter bearings)
IT 43136-14-7P **67144-13-2P** 103522-96-9P **117328-80-0P 117328-81-1P 117328-82-2P 117328-83-3P 117328-84-4P** 117328-85-5P 117328-86-6P 117328-87-7P
RL: PREP (Preparation)
(preparation of, thickener, for **lubricating greases**, for reducing squeaky noise from small-diameter bearings)
IT 101-68-8D, reaction products with C6-20 fatty amines 111-86-4D, n-Octylamine, reaction products with isocyanates 124-30-1D, n-Octadecylamine, reaction products with isocyanates 26471-62-5D, TDI, reaction products with C6-20 fatty amines
RL: USES (Uses)
(thickener, for **lubricating greases**, for reducing squeaky noise from small-diameter bearings)

L52 ANSWER 16 OF 18 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1981:606551 HCAPLUS
DOCUMENT NUMBER: 95:206551
TITLE: **Lubricating greases**
PATENT ASSIGNEE(S): Mitsui Toatsu Chemicals, Inc., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 4 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 56093799	A	19810729	JP 1979-170441	197912 28
			<--	
JP 61021515	B	19860527		

PRIORITY APPLN. INFO.: JP 1979-170441 A 197912 28

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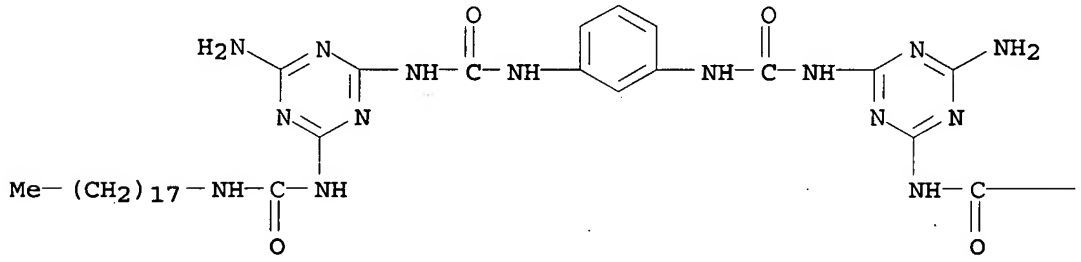
AB **Lubricating greases** containing s-triazine-polyureanized compds. are manufactured by treating a ureidomelamine with a diisocyanate in a base oil. Thus, a mixture containing Number 500 neutral oil 50, octadecylureidomelamine [20103-66-6] 6.2, and tolylene diisocyanate [26471-62-5] 1.25 g was heated to 152° to give a grease having a consistency (JIS K 2560) of 174 and a pour point of ≥200°.

IT **79800-72-9P**
RL: PREP (Preparation)
(manufacture of, as thickener for **lubricating greases**)

RN 79800-72-9 HCAPLUS

CN Urea, N,N''-(methyl-1,3-phenylene)bis[N'-[4-amino-6-[[(octadecylamino)carbonyl]amino]-1,3,5-triazin-2-yl]- (9CI) (CA INDEX NAME)

PAGE 1-A



D1—Me

PAGE 1-B

—NH—$(CH_2)_{17}$—Me

IC C10M005-20

CC 51-7 (Fossil Fuels, Derivatives, and Related Products)
ST **lubricating grease** thickener triazine polyurea; octadecylureidomelamine grease thickener
IT **Lubricating grease** additives
(thickener, octadecylureidomelamine-tolylene diisocyanate reaction products as)
IT **79800-72-9P**
RL: PREP (Preparation)
(manufacture of, as thickener for **lubricating greases**)
IT 20103-66-6D, reaction products with tolylene diisocyanate
26471-62-5D, reaction products with octadecylureidomelamine
RL: USES (Uses)
(thickener, for **lubricating greases**)

L52 ANSWER 17 OF 18 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1978:513761 HCAPLUS
DOCUMENT NUMBER: 89:113761
TITLE: Triazine-urea grease thickeners
INVENTOR(S): Wulfers, Thomas F.
PATENT ASSIGNEE(S): Shell Oil Co., USA
SOURCE: U.S., 6 pp.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 4026890	A	19770531	US 1975-635532 <--	19751126
CA 1063110	A1	19790925	CA 1976-265535 <--	19761112
SE 7613132	A	19770527	SE 1976-13132 <--	19761124
JP 52065284	A	19770530	JP 1976-141761 <--	19761124
DE 2653408	A1	19770608	DE 1976-2653408 <--	19761124
GB 1557319	A	19791205	GB 1976-48966 <--	19761124
US 4113640	A	19780912	US 1977-852395 <--	19771117

PRIORITY APPLN. INFO.: US 1975-635532 A

197511
26
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US 1977-769252 A1
197702
16
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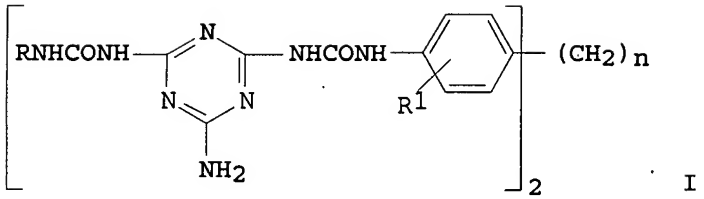


I

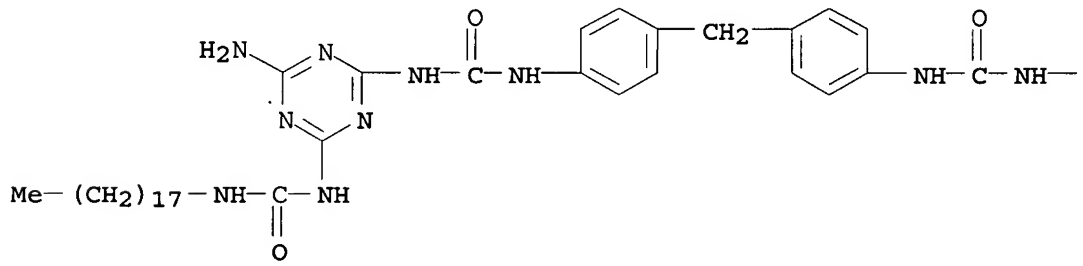
AB I (R = C16-22 hydrocarbyl, R1 = H or Me, n = 0 or 1) are effective as high-temperature grease thickeners. These triazine-urea compds. are prepared by the reaction of melamine [108-78-1] with an alkyl isocyanate to give a ureido-s-triazine intermediate, followed by the reaction of the intermediate with a dinuclear aromatic diisocyanate. Thus, a solution of 12.6 g melamine in 120 mL DMF was heated to boiling, and 29.5 g octadecyl isocyanate [112-96-9] was added. The mixture was refluxed 1 h and filtered to give 40 g 4,6-diamino-2-(octadecylureido)-s-triazine (II) [20103-66-6]. 4,4'-Diisocyanato-3,3'-dimethylbiphenyl [91-97-4] was added to 21 g II in 300 mL xylene, and the mixture was refluxed for .apprx.12 h and cooled. Removal of the solvent by a rotary evaporator and washing with ether gave I (R = octadecyl, R1 = Me, n = 0 (III) [67080-23-3]. A grease prepared from 445.0 g neutral oil and 55.0 g III had an ASTM dropping point of 505°F and an ASTM worked penetration (D 217, 60 strokes) of 290.

IT **67080-19-7P**
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation and use of, as **lubricating grease** thickeners)

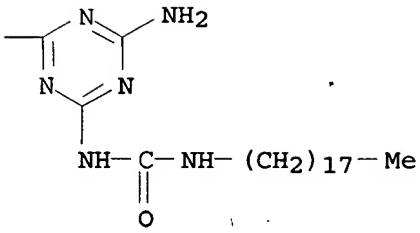
RN 67080-19-7 HCAPLUS

CN Urea, N,N''-(methylenedi-4,1-phenylene)bis[N'-[4-amino-6-[[(octadecylamino)carbonyl]amino]-1,3,5-triazin-2-yl]- (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 1-B



IC C07D251-70
INCL 260249600
CC 51-7 (Fossil Fuels, Derivatives, and Related Products)
Section cross-reference(s): 28
ST triazine urea grease thickener; **lubricating grease** thickener manuf; melamine reaction alkyl isocyanate; ureidotriazine prepn reaction
IT **Lubricating grease** additives
(thickeners, triazine-urea compds., manufacture of)
IT **67080-19-7P 67080-20-0P 67080-21-1P**
67080-22-2P 67080-23-3P
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation and use of, as **lubricating grease** thickeners)

L52 ANSWER 18 OF 18 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1969:39560 HCAPLUS
DOCUMENT NUMBER: 70:39560
TITLE: Organo-polysiloxane lubricating oil
INVENTOR(S): Nitzsche, Siegfried; Riedle, Rudolf; Bauer, Ignaz
PATENT ASSIGNEE(S): Wacker-Chemie G.m.b.H.
SOURCE: Ger., 4 pp.
CODEN: GWXXAW
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

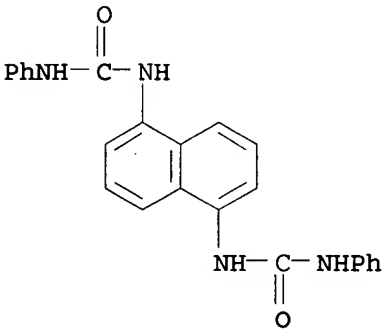
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 1284554		19681205	DE 1966-W41598	196605 17 <--
FR 1522759			FR	
GB 1165784			GB	
US 3423318		19690121	US	196705 16 <--

AB Addition of diurea compds., such as dicyclohexyl-aminenaphthalenediurea to polysiloxane-containing **lubricating greases** for the manufacture of low- and high-temperature lubricants, e.g. 315 g. 1,5-naphthylene diisocyanate are dissolved at 70° in 3 l. perchlorethylene. Thus, 315 g. cyclohexylamine in 1 l.

perchlorethylene was slowly added with agitation, reacted for 2 hrs. at 70°, the diurea compound formed is filtered, washed with solvent, and dried at 1-120°. The dried product is pulverized and mixed on a 3-roll mill with 3100 g. PhMe polysiloxane with trimethylsilyl end groups (viscosity 400 centistokes and n2D5 at 25° 1505) to produce a homogenous, soft paste.

IT **22119-62-6**
RL: USES (Uses)
(siloxane-base **lubricating greases** containing)

RN 22119-62-6 HCAPLUS
CN Urea, 1,1'-(1,5-naphthylene)bis[3-phenyl- (8CI) (CA INDEX NAME)



IC C10M
CC 51 (Petroleum, Petroleum Derivatives, and Related Products)
IT Siloxanes, uses and miscellaneous
RL: USES (Uses)
(**lubricating greases** containing dicyclohexylaminenaphthalenediurea and)
IT **Lubricating greases**
(siloxane-base, containing dicyclohexylaminenaphthalenediurea)
IT **22119-62-6**
RL: USES (Uses)
(siloxane-base **lubricating greases** containing)

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L57 ANSWER 1 OF 4 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2003:173728 HCAPLUS
DOCUMENT NUMBER: 138:223986
TITLE: Non-toxic biodegradable **lubricating grease** based on vegetable oils
INVENTOR(S): Beyer, Jorgen Peder; Lindemann, Soren
PATENT ASSIGNEE(S): Abcon Aps, Den.
SOURCE: PCT Int. Appl., 14 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2003018729	A1	20030306	WO 2002-DK567	

200208
30
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W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

NO 2004001349 A 20040528 NO 2004-1349
200403
31
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PRIORITY APPLN. INFO.: US 2001-315933P P
200108
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WO 2002-DK567 W
200208
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AB A nontoxic biodegradable grease is disclosed for lubricating mechanisms which are exposed to high load, such as curving rails in railways and wheel flanges on railway cars and locomotives, as well as for lubricating all sorts of equipment working in areas where full biodegradability is required such as in agriculture, forestry, sports areas and marine environments. The grease comprises a glyceride oil, one or more stearates, one or more long chain esters, bentonite, and a meal. Where the grease is exposed to daylight, it usually further comprises an antioxidant, and to further enhance the lubricating capacity of the grease a small amount of polytetrafluoroethylene (PTFE) may be added.

IC ICM C10M169-04
CC 51-8 (Fossil Fuels, Derivatives, and Related Products)
Section cross-reference(s): 45
ST nontoxic biodegradable grease machine railway vegetable oil stearate clay; **lubricating grease** biodegradable oil **additive** chelating **agent thickener** PTFE
IT **Lubricating grease** additives
(antioxidants; non-toxic biodegradable grease based on vegetable oils)
IT **Lubricating grease** additives
(extreme-pressure; non-toxic biodegradable grease based on vegetable oils)
IT Railways
(greases for; non-toxic biodegradable **lubricating grease** based on vegetable oils)
IT Antioxidants
(**lubricating grease** additives; non-toxic biodegradable grease based on vegetable oils)
IT Biodegradable materials
Lubricating greases
(non-toxic biodegradable **lubricating grease** based on vegetable oils)
IT Fluoropolymers, uses
RL: MOA (Modifier or additive use); TEM (Technical or engineered

material use); USES (Uses)
(powder; non-toxic biodegradable **lubricating grease** based on vegetable oils)

IT 50-81-7, Ascorbic acid, uses 50-81-7D, Ascorbic acid, esters of 77-92-9, Citric acid, uses 77-92-9D, Citric acid, esters with mono- and di-glycerides 7664-38-2, Phosphoric acid, uses 7664-38-2D, Phosphoric acid, esters of
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(metal chelating agent; non-toxic biodegradable **lubricating grease** based on vegetable oils)

IT 57-11-4D, Stearic acid, metal salts 108-32-7, Propylene carbonate 121-79-9, n-Propyl gallate 121-79-9D, n-Propyl gallate, esters with mono- and di-glycerides 122-39-4, Diphenylamine, uses 128-37-0, BHT, uses 557-04-0, Magnesium stearate 557-05-1, Zinc stearate 1592-23-0, Calcium stearate 4485-12-5, Lithium stearate 7732-18-5, Water, uses 25013-16-5, BHA
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(non-toxic biodegradable **lubricating grease** based on vegetable oils)

IT 9002-84-0, **Polytetrafluoroethylene**
RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
(**powder**; non-toxic biodegradable **lubricating grease** based on vegetable oils)

REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L57 ANSWER 2 OF 4 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1996:284455 HCAPLUS
DOCUMENT NUMBER: 124:321261
TITLE: Urea compound-containing **lubricating grease** for high temperatures
INVENTOR(S): Schreiber, Hans; Seigert, Peter; Konegen, Herbert; Hildebrandt, Wolfgang
PATENT ASSIGNEE(S): Gkn Automotive Ag., Germany
SOURCE: Ger. Offen., 12 pp.
CODEN: GWXXBX
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 19530504	A1	19960314	DE 1995-19530504	199508 18
			<--	
DE 19530504	C2	19970911		
US 5670461	A	19970923	US 1995-515287	199508 15
			<--	
JP 08170091	A	19960702	JP 1995-209743	199508 17

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JP 2911789	B2	19990623		
FR 2723747	A1	19960223	FR 1995-9933	199508 18
			<--	
FR 2723747	B1	19970905		
ES 2106681	A1	19971101	ES 1995-1668	199508 18
			<--	
ES 2106681	B1	19980701		

PRIORITY APPLN. INFO.: DE 1994-4429507 A1 199408 19

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DE 1994-4437742 A1 199410 21

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AB The **lubricating grease** on the basis of mineral and/or synthetic oils contains urea **compds.** as **thickeners**, dispersed MoS2 **powder**, graphite, **polytetrafluoroethylene**, ≥1 Mo organic compound (e.g., Mo dithiophosphate, Mo dithiocarbamate), and conventional lubricating oil additives. The (MoS2 + graphite + polytetrafluoroethylene + Mo organic compound) content in the grease is 2-5 weight%. Typically, the urea compound is prepared from primary C8-22 fatty amines and isocyanate.

IC ICM C10M169-06
ICS C10M119-24; C10M125-22; C10M125-02; C10M147-02; C10M139-00

ICI C10M169-06, C10M115-08, C10M125-22, C10M125-02, C10M147-02, C10M139-00, C10M135-36, C10N050-10, C10N040-04

CC 51-8 (Fossil Fuels, Derivatives, and Related Products)

ST **lubricating grease** urea compd contg

IT **Lubricating greases**
(urea compound-containing **lubricating grease** for high temps.)

IT Amines, uses
RL: NUU (Other use, unclassified); USES (Uses)
(fatty, tallow, hydrogenated; reaction product with diphenylmethanediisocyanate in urea compound-containing **lubricating grease** for high temps.)

IT 101-68-8D, 4,4'-Diphenylmethanediisocyanate, reaction product with hydrogenated tallow fatty amines 1072-71-5, 1,3,4-Thiadiazolidine-2,5-dithione 9002-84-0, Polytetrafluoroethylene 15834-33-0D, Dithiophosphoric acid, molybdenum salt 176255-30-4
RL: NUU (Other use, unclassified); USES (Uses)
(in urea compound-containing **lubricating grease** for high temps.)

IT 1317-33-5, Molybdenum sulfide, uses 7782-42-5, Graphite, uses
RL: NUU (Other use, unclassified); USES (Uses)
(powder; in urea compound-containing **lubricating grease** for high temps.)

L57 ANSWER 3 OF 4 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1980:570905 HCAPLUS
DOCUMENT NUMBER: 93:170905
TITLE: Solid lubricants for break-in of bearings
PATENT ASSIGNEE(S): Sankyo Oilless Industries, Inc., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 3 pp.

CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 55082196	A	19800620	JP 1978-154098	197812 15

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PRIORITY APPLN. INFO.: JP 1978-154098 A 197812 15

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AB The title lubricants for prevention of the failure of bearing materials during the initial stage of usage are mixts. containing 80-95 weight% Ca soap grease (e.g., cup grease) and 5-20 weight% **powdered polytetrafluoroethylene** (I) [9002-84-0], MoS2, and(or) graphite. Thus, a solid lubricant containing Ca soap grease 85, MoS2 12, and I 3 weight% had a frictional coefficient about one-half that of a com. cup **grease** when the **lubricant** and the **grease** were tested under similar conditions.

IC C10M005-16; C10M005-02; C10M005-18; F16N015-00

CC 51-7 (Fossil Fuels, Derivatives, and Related Products)

IT **Lubricating greases**
(calcium-base, solid compns. containing, for breaking-in of bearings, properties of)

IT **Lubricating grease additives**
(**thickeners**, calcium soaps, solid lubricants containing, for breaking-in of bearings)

L57 ANSWER 4 OF 4 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1974:523957 HCAPLUS
DOCUMENT NUMBER: 81:123957
TITLE: Poly(tetrafluoroethylene) and fluorinated ethylene-propylene **grease lubricants**
AUTHOR(S): Christian, John B.; Arkles, Barry
CORPORATE SOURCE: Air Force Mater. Lab., Wright-Patterson Air Force Base, OH, USA
SOURCE: Lubrication Engineering (**1974**), 30(3), 136-43
CODEN: LUENAG; ISSN: 0024-7154
DOCUMENT TYPE: Journal
LANGUAGE: English

AB The stability of greases produced from perfluoroalkyl ether and trifluoropropylmethyl polysiloxane oils thickened by poly(tetrafluoroethylene) (PTFE) and fluorinated ethylene-propylene copolymer (FEP) under extreme conditions at high speeds and high loads over extended periods of time were studied. Com. PTFE and FEP powders were evaluated. The most stable greases were produced from the tetrafluoroethylene lubricant solids having the smallest particle size, the highest oil absorption and surface area, and the highest critical surface tension with respect to the surface tension of the oil. Oil absorption correlated directly with critical surface tension and surface area. Separation and penetration values were in agreement with predictions,based on **fluorocarbon**

powder data. The greases were also evaluated for wear properties and are suitable for many aerospace applications.

CC 51-7 (Fossil Fuels, Derivatives, and Related Products)
Section cross-reference(s): 37

ST **lubricating grease** thickener fluorinated polymer; polytetrafluoroethylene **lubricating grease** thickener; FEP **lubricating grease** thickener; siloxane fluoro **lubricating grease**; ether fluoro **lubricating grease**

IT Perfluoro compounds
RL: USES (Uses)
(**lubricating greases** containing)

IT Ethers, uses and miscellaneous
RL: USES (Uses)
(perfluoroalkyl, **lubricating greases**, thickeners for)

IT **Lubricating grease additives**
(**thickeners**, fluorinated polymers)

IT Siloxanes and Silicones, uses and miscellaneous
RL: USES (Uses)
(trifluoropropylmethyl, **lubricating greases**, thickeners for)

IT 9002-84-0 25067-11-2
RL: USES (Uses)
(**lubricating grease** thickeners)

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